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ABSTRACT

This directory lists the institutions awarded support by the National Science Foundation for 276 summer institutes in 1972 for secondary school teachers of science and/or mathematics. The introduction gives information on "unitary" and "sequential" institutes, eligibility and selection of participants, applications, and information concerning individual institutes. The institutes are listed by subject matter: astronomy, biology, chemistry, earth science, engineering science, general and physical science, mathematics, physics, radioactivity and nuclear science, social sciences (economics, geography, psychology, sociology) science and society, interdisciplinary environmental studies, and multiple fields. Each entry includes the date and duration of the institute, title, type of participant and planned level of work, name of instructor, and address. There is also a brief listing of comprehensive projects at the Universities of Arkansas, Mississippi, Notre Dame, South Dakota, and Wyoming, and at San Jose State College and Virginia State College. These projects represent integrated approaches to teacher education with both preservice and in-service components that offer opportunities for full and part-time study during the academic year and in the summer. (MBM)

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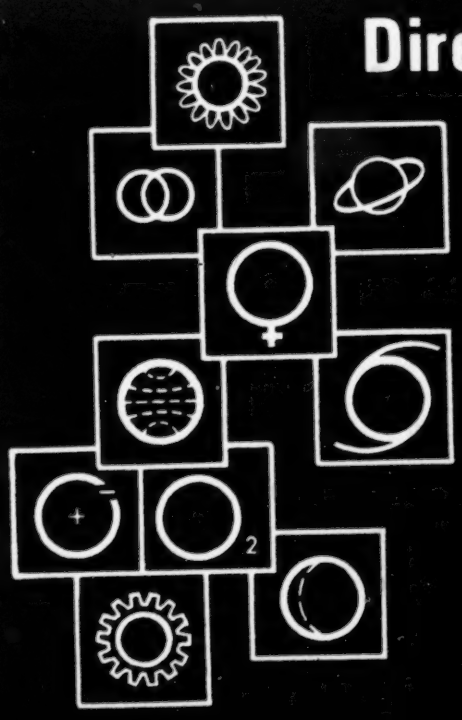
1972 Directory



SUMMER INSTITUTES

for Secondary School Teachers of Science, Mathematics and Social Science

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
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NATIONAL SCIENCE FOUNDATION

Summer Institutes for Secondary School Teachers of Science and Mathematics, 1972

INTRODUCTION

Many secondary schools and school systems have begun to implement important changes in their science or mathematics programs or are seriously considering doing so. The principal objective of the National Science Foundation's Summer Institutes for Secondary School Teachers is that of providing to teachers in such schools training and information which will enable them to help their schools, to the maximum extent possible, effect those constructive changes. Therefore applicants to an institute will be expected to indicate explicitly how their participation would relate to educational developments in their schools, and that statement must be endorsed by a local school authority. It should be noted that this constitutes a significant departure from the earlier NSF Summer Institute program objective of up-dating the subject-matter knowledge of teachers as individual professionals.

This directory lists the institutions awarded support by the Foundation for 276 institutes for secondary school teachers of science and/or mathematics. Funds have been made available to provide financial assistance in 1972 for about 10,000 teacher-participants.

The NSF grant for each institute covers the cost of tuition, enrollment and health fees, stipends, and allowances. The institute director is responsible for selecting the teacher-participants and determining the exact amounts of the stipends and allowances. In those institutes where costs are abnormally high, individual stipends up to $100 per week may be paid, but in order to provide study opportunities and stipends for as many teachers as possible, the maximum stipend in most institutes will be $75 per week for the period of attendance, and an allowance up to $15 per week may be paid for each dependent up to four. A travel allowance is calculated at not more than 8¢ per mile for one round

trip between home and institute, with a maximum allowance of $120. (Travel allowances in excess of $120 may be awarded to participants traveling to or from points outside of the 48 contiguous States; up to round trip jet economy fare may be allowed in such cases.) Travel and dependency allowances are not granted by institutes to noncitizens unless they teach in U.S. schools.

Institutes are permitted to offer smaller sums than the maxima, in order to accommodate more teachers. Since the institute expenses of participants who live at home are less than the expenses of participants who must rent quarters, stipends for participants who live at home during the institute will be reduced by amounts at least commensurate with the resultant reduction in their expenses for food and housing.

In most circumstances, institute subventions are excludable in whole or part from gross income for Federal tax computation. More detailed information will be distributed by the institutes. In case of doubt, the individual participant should consult his District Director of Internal Revenue.

"Unitary" and "Sequential" Institutes

In this directory each institute is classified as "Unitary" (Un) or "Sequential" (Seq). An institute of "Unitary" type is designed to offer primarily a single summer of study for a particular group of participants. A unitary institute might be offered only once; or it may be repeated several summers with little or great modification, but principally for different participants each summer. An institute of "Sequential" type is designed primarily to offer a coordinated sequence of work so that qualified participants may return to successive institutes to work toward a specific goal, such as attainment of a master's degree.

Because of a considerable decrease in the total number of stipends that can be made available in 1972, very few openings can be offered for entrants into Sequences this year.

Eligibility and Selection

Any teacher who is currently employed at least half-time in grades 7 through 12 and whose teaching program in those grades includes at least one full course in mathematics or science is eligible to *participate* in a Summer Institute for Secondary School Teachers; he is also eligible to receive a *stipend* for such participation unless he has already exhausted his eligibility for further stipends at this time (see below). In the social sciences eligibility for stipends is extended also to applicants who teach at least one secondary school course in which substantial amounts of one or more of the social sciences are taught, or who can furnish evidence that they are required to teach such a course in the academic year following the institute. Science and mathematics subject-matter supervisors at the secondary school level are also eligible to participate and to receive stipends. In awarding stipends to teachers, preference will be given to individuals who have taught for at least 3 years.

Probable benefit to his school and his students will be a primary basis for judgment in selecting each participant to be admitted to an institute in 1972.

In the operation of the institute and in selecting individuals for participation in it, the host institution will not discriminate on the ground of the race, creed, color, sex, or national origin of any applicant or participant.

Teachers may need more than one summer of study, so participation is not generally limited to a single institute. However, each summer there are many more applications for stipends than there are stipends available. In order to give individual teachers the opportunity to progress toward the completion of needed study programs as well as to insure participation by the largest possible number of teachers, the following guidelines have been established:

1. In all institutes, in awarding stipends and allowances, priority among applicants of comparable and suitable qualifications will be given to those applicants who have not previously received sti-

pends in Academic Year or Summer Institutes, except for qualified returnees in sequences already begun.

2. In unitary institutes and isolated portions of sequences, a teacher may be granted Summer Institute stipends and/or allowances no oftener than once every 3 years, unless he has an appropriate and well defined plan for self-improvement.

3. It is permissible for a teacher to be granted stipends in several successive summers if he is pursuing a logical and definite plan of improvement. Such a plan may involve work toward an advanced degree, or study in different subject-matter areas if all are taught by the individual, or study at increasingly advanced levels in the same discipline. The following restrictions are imposed on the maximum number of stipends an individual may receive:

(a) A teacher who is pursuing a logical plan in unitary or sequential institutes may receive the equivalent of full stipend support (and the dependency allowances for which he is eligible) for not more than 4 summers or 32 weeks, whichever is achieved first; this limit includes stipends received prior to the sequence. Individual exceptions may be allowed in unusual circumstances, but the fact that a teacher has exhausted stipend eligibility in midstream of a sequence is *not* an unusual circumstance justifying an exception to this rule.

It is realized that many teachers cannot reach their subject-matter goals within 4 summers. It is also realized that in those sequences that lead to a degree, many participants may not be able to complete the degree requirements in 4 Summer Institutes (or 32 weeks). It is the intention of the Foundation to assist such teachers a reasonable distance toward their goals while

reserving the greater number of stipend opportunities for those teachers who have as yet received little or no assistance.

(b) It is permissible to distribute the equivalent of full subvention for 4 summers (but not more than 32 weeks) over a longer period by granting partial stipends and reduced allowances. Dollar amounts up to the accumulated reductions can be made available in additional summer(s).

(c) Following receipt of the equivalent of full subvention for 4 summers (but not more than 32 weeks), or following receipt of an Academic Year Institute stipend, a teacher may receive subsequent Summer Institute subventions no oftener than once every third year.

4. A teacher who will receive a stipend from an NSF-supported Academic Year Institute may not receive a Summer Institute stipend in the preceding summer unless (1) the director of the Academic Year Institute approves and (2) the study program of the Summer Institute is coordinated with that of the Academic Year Institute. If a participant who is in midstream in a Summer Institute sequence accepts an AYI stipend offer, he may not receive further support from the summer sequence.

5. Secondary school science and mathematics teachers may, at the option of the local institute director, be accepted as institute participants on a tuition-free, no-stipend basis. Host institutions are encouraged (if their regulations permit) to extend this opportunity to—among others—participants who are in midstream in a sequence but who have exhausted their eligibility for further institute stipends at this time.

6. Participation in In-Service Institutes does not affect eligibility for Summer Institute stipends.

For answers to questions concerning eligibility for any particular institute, the potential applicant should always consult with the director of that institute. The director and staff of each institute have the responsibility for the selection of participants and awarding stipends.

Applications

Each application to an NSF-supported Summer Institute must include a statement endorsed by a local school authority on how the applicant plans to apply in his instructional duties that which he would learn through participation in that institute. The application form makes provision for the required endorsement.

Application forms are obtained from the local directors of the institutes. They are obtainable *only* from host institutions and NOT from the National Science Foundation.

Social security numbers must be recorded on all institute application forms, for identification and record-keeping purposes.

The completed institute application forms (including in every case an Applicant Information Sheet for the National Science Foundation) must be postmarked by March 1, 1972, to guarantee consideration.

Initial stipend offers will be made by March 22, but not before March 15. (Earlier offers may be made to *its own returnees* by an institute that is specifically Sequential.) In every case, recipients have until April 5 to accept or decline.

Transcripts of credits and letters of reference will not be needed by directors of some institutes, and should be sent only to those directors who request them. However, the applicant will find it necessary to refer to college credit transcripts in providing some of the information required in applications.

Many institutes select a list of alternates, to whom stipends may later become available. *When an applicant is offered alternate status by an institute, he should immediately notify the institute director if he does not wish to be considered as an alternate or if he accepts a stipend elsewhere.*

Information Concerning Individual Institutes

To provide guidance for teachers in the choice of institutes best suited to their needs, backgrounds, and teaching levels, each director has supplied items of information in addition to listing the subject matter to be covered. Code symbols included in each entry in this directory indicate the following, in the order listed:

A. Classification of each institute as "Sequential" or "Unitary";
B. The approximate number of stipends available in the institute;
C. The grade level of teachers for whom the institute is designed;
D. The depth of subject-matter background needed for the institute courses.

Specifically, the symbols have the following meanings:

The institute is classed as:

(Seq) "Sequential" type (see page 2);
(Seq*) "Sequential" institute which for local participants includes a coordinated In-Service Institute program;
(Un) "Unitary" type (see page 2);
(Un*) "Unitary" Summer Institute with which a coordinated In-Service Institute for local participants forms a sequence.

The institute is designed for teachers in:

(JH) Junior High School (grades 7-9);
(SH) Senior High School (grades 9-12).

The planned level of work in the institute courses is indicated by the following coded statements:

(0) Work at level of introductory course such as might offered to students who have practically no academic background in the basic subject matter;
(1) Work at level normally requiring approximately a year (6-10 semester-hours) of prior study of basic subject matter;
(2) Work at level normally requiring about 2 years (12-18 semester-hours) of prior study of basic subject matter;

(3) Work at level normally requiring about 3 years of prior study of basic subject matter;
(4) Work at level comparable to that of the usual subject-matter course for advanced undergraduates or beginning graduates, assuming a background essentially equivalent to an undergraduate major in the field;
(5) Work at level comparable to that of the usual graduate courses in the field.

As an example, the following series of code symbols: (Un; 40; JH; 0, 1) characterizes an institute as Unitary, with approximately 40 stipends for Junior High School teachers who have little or no background in the subject matter of the institute. The series: (Seq; 20/50; SH; 3, 4) indicates an institute to be of Sequential type, having a total of approximately 50 stipends, of which about 20 are available for new entrants into the sequence in 1972—the remainder being available for returnees who began this sequence in an earlier summer; the institute is designed for Senior High School teachers who have stronger backgrounds than needed in the preceding example. Notations such as 0/30 or 0/23 indicate that no openings are available this year for new entrants into those Sequences.

The following entries give very brief summaries of essential information, intended to help applicants in making preliminary choices of institutes which may be appropriate. Requests for further information concerning any particular institute, and for the needed application materials, should be sent *preferably by postal card,* with complete return address clearly printed, to the address given in the entry.

Teachers are advised to study local brochures carefully and to submit applications only to institutes that specifically fit their backgrounds and needs.

INSTITUTES FOR SECONDARY SCHOOL TEACHERS

Astronomy

SAM HOUSTON STATE UNIVERSITY, 6 weeks, May 30—July 7: *Stars and Stellar Systems; Basic Physics of the Solar System;* for teachers of science and mathematics. Dr. Charles K. Manka, Department of Physics, Box 2267-A, Sam Houston State University, Huntsville, TX 77340.
(Un; 30; SH; 0)

Biology

BALL STATE UNIVERSITY, 8 weeks, June 12—August 4: *Modern Biology; Developments in Biology Education (BSCS Blue Version);* for teachers of biology. Dr. Thomas R. Mertens, Department of Biology, Ball State University, Muncie, IN 47306. (Un; 40; JH, SH; 2, 3)

BOWDOIN COLLEGE, 6 weeks, June 26—August 4: *Marine Biology, with Emphasis on Ecology;* for teachers of biology. Prof. Alton H. Gustafson, Department of Biology, Bowdoin College, Brunswick, ME 04011. (Un; 36; SH; 3, 4, 5)

UNIVERSITY OF CALIFORNIA, BERKELEY, 8 weeks, June 19—August 11: *Molecular Biology;* for teachers of biology. Dr. C. Arthur Knight, Department of Molecular Biology, University of California, Berkeley, CA 94720.
(Un; 40; SH; 3, 4)

CENTRAL STATE UNIVERSITY, 8 weeks, June 12—August 4: *Laboratory Training Program;* for teachers of biology. Dr. DeField T. Holmes, Department of Biology, Central State University, Wilberforce, OH 45384. (Un; 24; SH; 4, 5)

UNIVERSITY OF COLORADO, 6 weeks, July 10—August 18: *Biology (BSCS Special Materials);* for teachers who teach or are preparing to offer a biology course for academically unsuccessful students. Dr. William V. Mayer, Director BSCS, University of Colorado, Boulder, CO 80302.
(Un; 31; SH; 2, 3, 4)

UNIVERSITY OF COLORADO, 6 weeks, July 10—August 18: *Biology (BSCS Second Course);* for teachers who teach or are preparing to offer a second year biology course. Dr. William V. Mayer, Director BSCS, University of Colorado, Boulder, CO 80302. (Un; 31; SH; 5)

DRAKE UNIVERSITY, 8 weeks, June 12—August 4: *Advanced Botany; Comparative Invertebrate Anatomy; Seminar;* for teachers of biology. Dr. Rodney A. Rogers, Department of Biology, Drake University, Des Moines, IA 50311. (Seq; 0/35; SH; 4, 5)

HOWARD UNIVERSITY, 8 weeks, June 26—August 18: *Molecular Biology; Recent Advances in Biology; Urban Biology, Field and Laboratory;* for teachers of biology. Dr. Marie C. Taylor, Department of Botany, Howard University, Washington, DC 20001. (Un; 25; JH, SH; 2)

INDIANA UNIVERSITY, 4 weeks, July 3—July 28: *Microbiology;* for teachers of biology. Dr. L. S. McClung, Department of Microbiology, Jordan Hall 336, Indiana University, Bloomington, IN 47401. (Un; 32; SH; 3, 4)

THE UNIVERSITY OF IOWA, 8 weeks, June 12—August 4: *Modern Biology (BSCS Blue Version); Bio-Organic Chemistry;* for teachers of biology. Dr. R. E. Yager, Department of Science Education, The University of Iowa, Iowa City, IA 52240. (Un; 40; SH; 3, 4)

JACKSON STATE COLLEGE, 8 weeks, June 11—August 5: *Modern Biology (BSCS Yellow Version); Investigations in Biology (BSCS Laboratory Blocks);* for teachers of biology. Dr. John E. Uzodinma, Department of Biology, Jackson State College, Jackson, MS 39217. (Un; 45; JH, SH; 2)

KANSAS STATE TEACHERS COLLEGE, 9 weeks, June 12—August 11: *Environmental Biology and Human Ecology;* for teachers of biology. Dr. Harold Durst, Department of Biology, Kansas State Teachers College, Emporia, KS 66801. (Un; 40; JH, SH; 2, 3, 4)

UNIVERSITY OF MICHIGAN, DEARBORN CAMPUS, 8 weeks, June 19—August 11: *Environmental Science;* for teachers of the life sciences from the metropolitan Detroit area. Dr. Orin G. Gelderloos, Department of Experimental Biology, University of Michigan, 4901 Evergreen Road, Dearborn, MI 48128. (Un; 30; JH, SH; 3)

MICHIGAN STATE UNIVERSITY, 10 weeks, June 17—August 26: *Botany; Physiology; Zoology; Field Ecology;* for teachers of biology. Dr. Frank R. Peabody, Science and Mathematics Teaching Center, Michigan State University, East Lansing, MI 48823. (Seq; 0/40; SH; 4, 5)

UNIVERSITY OF MONTANA, 8 weeks, June 25—August 19, at Biological Station, Flathead Lake, Montana: *Systematic Botany; Bryology; Pteridology; Limnology; Aquatic Plants; Problems in Morphology;* for teachers of biology. Dr. John F. Tibbs, Department of Zoology, University of Montana, Missoula, MT 59801.
(Seq; 0/21; SH; 3, 4, 5)

MOUNT MARTY COLLEGE, 8 weeks, June 19—August 11: *Environmental Biology in Field and Laboratory;* for teachers of biology. Sister Veronica Fasbender, Department of Biology, Mount Marty College, Yankton, SD 57078.
(Un; 30; JH, SH; 2, 3)

UNIVERSITY OF NEBRASKA, 8 weeks, June 12—August 4: *Microtechnique; Plant Taxonomy; Modern Topics in Plant Physiology; Seminar;* for teachers of biology. Prof. John F. Davidson, Department of Botany, University of Nebraska, Lincoln, NB 68508. (Un; 15; SH; 3, 4, 5)

NORFOLK STATE COLLEGE, 8 weeks, June 19—August 11: *Molecular Genetics and Cytogenetics; Topics in Animal Behavior, Physiology and Evolution; Ecology, Man and His Environment;* for teachers of biology. Dr. Paul L. Brown, Department of Biology, Norfolk State College, Norfolk, VA 23504. (Un; 30; SH; 2, 3)

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, 6 weeks, July 7—August 18: *Evolutionary Survey of Plants; Topics in Cell Biology;* for teachers of biology. Dr. Paul B. Hounshell, 103 Peabody Hall, University of North Carolina, Chapel Hill, NC 27514.
(Seq; 0/30; JH, SH; 1, 2)

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY, 9 weeks, June 12—August 12: *Environmental Biology; Invertebrate Zoology; Introductory Experimental Biology;* for teachers of biology. Dr. Artis P. Graves, Department of Biology, North Carolina Agricultural and Technical State University, Greensboro, NC 27411. (Seq; 0/34; SH; 1)

NORTHEAST MISSOURI STATE COLLEGE, 8 weeks, June 12—August 4: *Ecological Core Program;* for teachers of biology. Dr. Dean A. Rosebery, Division of Science, Northeast Missouri State College, Kirksville, MO 63501.
(Seq; 0/35; SH; 5)

UNIVERSITY OF OKLAHOMA, 8 weeks, June 1—July 29: *Molecular Biology; Principles of Plant Physiology; Genetics; Systematic Botany;* for teachers of biology. (Director: Dr. Howard W. Larsh, University of Oklahoma.) Write: Mrs. Lois C. Brandt, Department of Botany and Microbiology, University of Oklahoma, 770 Van Vleet Oval, Norman, OK 73069.
(Seq; 0/42; SH; 3, 4, 5)

OLD DOMINION UNIVERSITY, 8 weeks, June 19—August 11: *Marine Science; Ecology; Earth Science;* for teachers of life sciences. Dr. Harold G. Marshall, Department of Biology, Old Dominion University, Norfolk, VA 23508.
(Un; 25; JH, SH; 4)

STATE UNIVERSITY COLLEGE AT OSWEGO, 6 weeks, July 10—August 18: *Modern Biology;* for New York State teachers of biology. Prof. Robert L. Salisbury, Department of Botany and Physiology, State University College, Oswego, NY 13126. (Seq; 0/27; SH; 4)

PURDUE UNIVERSITY, 8 weeks, June 18—August 11: *Modern Biology; Genetics; Plant Physiology;* for teachers of biology. Dr. J. Bennet Olson, Department of Biological Sciences, Purdue University, Lafayette, IN 47907.
(Seq; 0/40; SH; 4, 5)

SAINT MARY'S COLLEGE, 6 weeks, June 19—July 28: *Histology; Biochemistry; Physiology; Evolution; Research;* for teachers of biology. Brother Charles Severin, Department of Biology, Saint Mary's College, Winona, MN 55987.
(Seq; 0/60; SH; 5)

SONOMA STATE COLLEGE, 7 weeks, June 19—August 4: *Field Biology and Ecology;* for teachers of biology. Dr. Joe H. Brumbaugh, Department of Biology, Sonoma State College, Rohnert Park, CA 94928. (Un; 42; SH; 2, 3, 4)

SOUTHERN METHODIST UNIVERSITY, 8 weeks, June 19—August 11: *Genetics; Vertebrate Histology; Seminar;* for teachers of biology. Dr. John O. Mecom, Department of Biology, Southern Methodist University, Dallas, TX 75222. (Seq; 0/6; JH, SH; 3, 4)

SOUTHERN UNIVERSITY, 8 weeks, June 12—August 4: *Growth and Development; Concepts in Physiology;* for teachers of biology. Dr. Spaulding M. Ruffin, Department of Chemistry, Southern University, Baton Rouge, LA 70813. (Seq; 0/10; SH; 2)

TEXAS SOUTHERN UNIVERSITY, 12 weeks, June 5—August 25: *Heredity and Evolution; Topics in Biology; Seminar;* for teachers of biology. Dr. Robert J. Terry, Department of Biology, Texas Southern University, Houston, TX 77004. (Seq; 40/40; JH, SH; 3, 4)

THIEL COLLEGE, 7 weeks, July 9—August 26: *Basic Ecology;* for teachers of biology. Dr. Ronald J. Ingersoll, Department of Biology, Thiel College, Greenville, PA 16125. (Un; 25; SH; 4)

WESTERN KENTUCKY UNIVERSITY, 5 weeks, July 17—August 19: *Freshwater Ecology;* for teachers of biology. Dr. Robert D. Hoyt, Department of Biology, Western Kentucky University, Bowling Green, KY 42101. (Un; 30; JH, SH; 2)

UNIVERSITY OF WISCONSIN SYSTEM, 6 weeks, June 19—July 28, at Pigeon Lake Biological Field Station, Chequamegon National Forest, Drummond, Wisconsin: *Field Biology; Field Ecology;* for teachers of biology. Dr. Marcus Fay, Department of Biology, University of Wisconsin-Eau Claire, Eau Claire, WI 54701. (Seq; 0/50; SH; 2)

Chemistry

ADELPHI UNIVERSITY, 6 weeks, July 6—August 16: *Modern Laboratory Methods; History of Chemistry;* for teachers of chemistry. Dr. Frederick A. Bettelheim, Department of Chemistry, Adelphi University, Garden City, NY 11530. (Seq*; 0/22; SH; 4)

BEAVER COLLEGE, 8 weeks, June 18—August 11: *Modern Chemical Concepts, and the Teaching of Chemistry by the CBA and CHEM Study Approaches;* for teachers of chemistry. Dr. Arthur C. Breyer, Department of Chemistry, Beaver College, Glenside, PA 19038. (Un; 40; SH; 2, 3, 4)

BOWDOIN COLLEGE, 6 weeks, June 26—August 4: *The Chemical Study of Environmental Problems;* for teachers of chemistry who teach an advanced placement or second year course. Prof. David A. Wheatland, Department of Chemistry, Bowdoin College, Brunswick, ME 04011. (Un; 36; SH; 3, 4)

BOWLING GREEN STATE UNIVERSITY, 10 weeks, June 19—August 30: *Advanced Inorganic Chemistry; Advanced Organic Chemistry; Introduction to Quantum Chemistry; Chemical Information; Thesis Research;* for teachers of chemistry. Dr. W. H. Hall, Department of Chemistry, Bowling Green State University, Bowling Green, OH 43403. (Seq; 0/54; SH; 4, 5)

HOPE COLLEGE, 8 weeks, June 26—August 18: *Basic Concepts in Chemistry;* for teachers of second year and advanced placement chemistry. Dr. Eugene C. Jekel, Department of Chemistry, Hope College, Holland, MI 49423. (Un; 40; SH; 4)

UNIVERSITY OF NEW HAMPSHIRE, 8 weeks, June 26—August 18: *Organic Chemistry; Physical Chemistry; Radiochemical Techniques; Advanced Inorganic Chemistry; Workshop for Chemistry Teachers;* for teachers of chemistry. Prof. Alexander R. Amell, University of New Hampshire, Durham, NH 03824. (Seq; 0/40; SH; 2, 3, 4)

UNIVERSITY OF NOTRE DAME, 7 weeks, June 26—August 11: *Principles of Chemistry;* for teachers of chemistry. Dr. Emil T. Hofman, Department of Chemistry, University of Notre Dame, Notre Dame, IN 46556. (Seq; 0/60; SH; 4)

PRATT INSTITUTE, 6 weeks, July 10—August 18: *Chemical Principles; Laboratory Investigations;* for teachers of science. Dr. John Michael O'Gorman, Department of Chemistry, Pratt Institute, Brooklyn, NY 11205. (Un; 25; SH; 0, 1)

PURDUE UNIVERSITY, 8 weeks, June 19—August 11: *Analytical Chemistry; Inorganic Chemistry; Physical Chemistry;* for teachers of chemistry. Dr. J. D. Herron, Department of Chemistry, FWA-3, Purdue University, Lafayette, IN 47907. (Seq; 0/44; SH; 4, 5)

RIPON COLLEGE, 7 weeks, June 26—August 11: *Energy and Structure as They Relate to Reactivity;* for teachers of chemistry. Prof. David W. Carley, Department of Chemistry, Ripon College, Ripon, WI 54971. (Un; 24; SH; 2, 3)

SETON HILL COLLEGE, 6 weeks, June 26—August 4: *Environmental Problems and Solutions;* for teachers of chemistry. Mrs. Barbara Raczkowski, Department of Chemistry, Seton Hill College, Greensburg, PA 15601. (Un; 40; SH; 1, 2, 3)

SIMMONS COLLEGE, 6 weeks, June 26—August 4: *Structure and the Nature of Bonding;* for teachers of chemistry. Dr. Jerry A. Bell, Department of Chemistry, Simmons College, 300 The Fenway, Boston, MA 02115. (Un; 25; SH; 1, 2)

SOUTHERN UNIVERSITY, 8 weeks, June 12—August 4: *Theories and Techniques of Organic Chemistry; Physical Chemistry with Mathematical Preparation;* for teachers of chemistry and general science. Dr. Spaulding M. Ruffin, Department of Chemistry, Southern University, Baton Rouge, LA 70813. (Seq; 10/30; JH, SH; 2)

TUSKEGEE INSTITUTE, 8 weeks, June 12—August 4: *Principles of Chemistry; Essential Mathematics for Chemistry and Physics;* for teachers of chemistry. Dr. Lawrence F. Koons, Department of Chemistry, Tuskegee Institute, Tuskegee Institute, AL 36088. (Seq; 32/32; SH; 1)

Earth Science

BOSTON COLLEGE, 6 weeks, June 26—August 4: *Field Investigations in Earth Science;* for teachers of earth science. Prof. George T. Ladd, Department of Geology and Geophysics, Boston College, Chestnut Hill, MA 02167.
(Seq; 0/30; JH, SH; 2, 3, 4, 5)

BRIDGEWATER STATE COLLEGE, 4 weeks, July 10—August 4: *Field Methods in Earth Science (ESCP);* for teachers of earth science. Dr. Robert F. Boutilier, Department of Earth Sciences, Bridgewater State College, Bridgewater, MA 02324. (Un; 30; JH; 0, 1)

UNIVERSITY OF CALIFORNIA, BERKELEY, 8 weeks, June 19—August 11: *Earth Sciences;* for teachers of life science and earth science. Dr. Wayne L. Fry, Lawrence Hall of Science, University of California, Berkeley, CA 94720.
(Un*; 40; SH; 2, 3)

FRANKLIN AND MARSHALL COLLEGE, 8 weeks, June 28—August 22: *Mineralogy and Petrology; Structural and Field Geology; Hydrogeology, Water Resources and Environment;* for teachers of earth science. Dr. Marvin E. Kauffman, Department of Geology, Franklin and Marshall College, Lancaster, PA 17604.
(Seq; 0/47; JH; 2, 3)

INDIANA UNIVERSITY, 8 weeks, June 26—August 18: *Paleontology; Structural Geology; Mineral Resources;* for teachers of earth science and general science. Dr. John B. Droste, Department of Geology, Indiana University, Bloomington, IN 47401. (Seq; 0/41; JH, SH; 2)

IOWA STATE UNIVERSITY, 5 weeks, June 18—July 22, at Philmont Scout Ranch, Cimarron, New Mexico: *Field Studies in Earth Science (ESCP);* for teachers of earth science. Dr. Keith M. Hussey, Department of Earth Science, Iowa State University, Ames, IA 50010.
(Un; 37; JH; 1)

KANSAS STATE UNIVERSITY, 8 weeks, June 5—July 29: *Earth Science;* for teachers of science. Dr. J. R. Chelikowsky, Department of Geology, Thompson Hall, Kansas State University, Manhattan, KS 66502. (Un; 40; JH, SH; 0, 1)

LAMAR UNIVERSITY, 6 weeks, June 5—July 14: *Earth Science (ESCP);* for teachers of earth science. Prof. William H. Matthews III, Department of Geology, Box 10031, Lamar University Station, Lamar University, Beaumont, TX 77710. (Un; 40; JH; 0, 1)

MINOT STATE COLLEGE, 6 weeks, June 26—August 4: *Laboratory and Field Studies in Earth Science;* for teachers of earth science. Dr. David Bickel, Division of Science, Minot State College, Minot, ND 58701. (Un; 30; JH, SH; 0, 1, 2)

NORTHERN ARIZONA UNIVERSITY, 8 weeks, June 19—August 12: *Field Project in Earth Science; Methods of Teaching Earth Science; Geology of Western North America;* for teachers of earth science in the western states. Dr. Stanley S. Beus, Department of Geology, Northern Arizona University, Flagstaff, AZ 86001. (Seq; 0/34; JH, SH; 4)

UNIVERSITY OF NOTRE DAME, 8 weeks, June 26—August 19: *Physical Geography; Astronomy; Meteorology;* for teachers of earth science and general science in the Chicago area. Rev. Michael J. Murphy, C.S.C., Department of Geology, Box 506, University of Notre Dame, Notre Dame, IN 46556. (Seq; 0/45; JH, SH; 1, 2)

UNIVERSITY OF NOTRE DAME, 8 weeks, June 18—August 11, at Montana State University, Bozeman, Montana: *Field Studies in the Northern Rockies;* for teachers of earth science and general science. Rev. Michael J. Murphy, C.S.C., Department of Geology, Box 506, University of Notre Dame, Notre Dame, IN 46556. (Seq; 0/44; JH, SH; 3, 4, 5)

THE OHIO STATE UNIVERSITY, 9 weeks, June 17—August 19, at Geologic Field Station, Ephraim, Utah: *Introduction to Geology; Problems in Geology; Development of Modern Science;* for teachers of earth science and general science. Dr. Edmund M. Spieker, 125 South Oval Drive, Columbus, OH 43210. (Un; 28; JH, SH; 0)

UNIVERSITY OF OKLAHOMA, 8 weeks, June 11—August 5, at Oklahoma Geology Camp, Canon City, Colorado: *Earth Science;* primarily for Oklahoma teachers of earth science and general science. (Director: Dr. Edward C. Stoever, Jr., University of Oklahoma.) Write: Dr. Alex R. Ross, School of Geology and Geophysics, University of Oklahoma, 830 Van Vleet Oval, Room 107, Norman, OK 73069. (Un; 40; JH; 0, 1)

UNIVERSITY OF OKLAHOMA, 8 weeks, June 1—July 29: *Earth Science: Geology, Astronomy, Meteorology, Oceanography;* for teachers of earth science and general science. Dr. Edward C. Stoever, Jr., 830 Van Vleet Oval, Room 107, University of Oklahoma, Norman, OK 73069. (Seq; 0/56; JH; 1, 2)

OKLAHOMA STATE UNIVERSITY, 8 weeks, June 5—July 28: *Meteorology; Astronomy; Historical Geology;* for Oklahoma teachers of earth science. Dr. John E. Stone, Department of Geology, Oklahoma State University, Stillwater, OK 74074. (Seq; 0/23; JH, SH; 0, 1)

UNIVERSITY OF SOUTHERN MISSISSIPPI, 10 weeks, June 5—August 11: *Meteorology; Climatology; Environmental Science;* for teachers of earth science and general science. Dr. Isadore L. Sonnier, Department of Science Education, Southern Station Box 202, Hattiesburg, MS 39401. (Un*; 30; JH; 0, 1)

TEXAS A&M UNIVERSITY, 9 weeks, June 9—August 10: *Conservation; Oceanography; Rocks and Minerals; Field Study;* for teachers of science. Dr. Melvin C. Schroeder, Department of Geology, Texas A&M University, College Station, TX 77843. (Seq; 0/34; JH, SH; 0, 1, 2)

VASSAR COLLEGE, 6 weeks, July 10—August 18: *Environmental Geology; Curriculum Development;* for teachers of earth science and general science. Dr. John H. Johnsen, Department of Geology and Geography, Vassar College, Poughkeepsie, NY 12601. (Un; 40; JH, SH; 0)

UNIVERSITY OF WASHINGTON, 7 weeks, July 5—August 22, at Skagit Valley College, Mt. Vernon, Washington: *The World of Water;* for teachers of earth science and general science. (Director: Dr. Richard H. Fleming, University of Washington.) Write: Mr. H. Robert Dursch, Oceanography Summer Institute, Skagit Valley College, Mt. Vernon, WA 98273.
(Un; 30; JH, SH; 2, 3)

WESLEYAN UNIVERSITY, 6 weeks, July 6—August 18: *Astronomy; Geology; Meteorology; Oceanography;* for teachers of earth science. Dr. James E. Cronin, Wesleyan Station, Middletown, CT 06457. (Seq; 0/15; JH, SH; 0, 1, 2, 3, 4)

WESTERN CAROLINA UNIVERSITY, 8 weeks, June 12—August 4: *Principles of Earth Science (ESCP); Demonstration Class;* for teachers of earth science and general science. Dr. John J. Chapman, Department of Earth Science, Western Carolina University, Cullowhee, NC 28723.
(Un; 36; JH, SH; 0, 1)

WESTERN WASHINGTON STATE COLLEGE, 8 weeks, June 26—August 18: *Physical Geology; Field Geology; Practicum;* for teachers of earth science. Dr. Robert A. Christman, Department of Geology, Western Washington State College, Bellingham, WA 98225. (Un; 30; JH, SH; 0, 1)

Engineering Science

UNIVERSITY OF COLORADO, 8 weeks, June 19—August 11: *Engineering Concepts (ECCP);* for teachers of mathematics and science. Prof. G. J. Maler, College of Engineering, University of Colorado, Boulder, CO 80302. (Un; 30; SH; 2)

POLYTECHNIC INSTITUTE OF BROOKLYN, 6 weeks, July 5—August 15, at Farmingdale, Long Island, New York: *Engineering Concepts (ECCP);* for teachers of science and mathematics. Dr. Thomas Liao, Enginering Concepts Curriculum Project, Polytechnic Institute of Brooklyn, 333 Jay Street, Brooklyn, NY 11201.
(Un; 30; SH; 0)

UNIVERSITY OF UTAH, 8 weeks, June 26—August 18: *Engineering Concepts (ECCP);* for teachers of mathematics, science, and social science. Prof. Fredrick R. Wagner, Department of Mechanical Engineering, University of Utah, Salt Lake City, UT 84112. (Un; 30; SH; 0)

UNIVERSITY OF WISCONSIN—MADISON, 8 weeks, June 12—August 5: *Engineering Concepts (ECCP);* for teachers of science, mathematics, and the social sciences. Prof. William W. Wuerger, Department of Engineering, University Extension, 432 North Lake Street, Madison, WI 53706. (Un; 30; JH, SH; 4)

UNIVERSITY OF WISCONSIN—SUPERIOR, 8 weeks, June 12—August 4: *The Man-Made World (ECCP);* for teachers of science. Dr. Kenneth E. Hershman, Center for the Advancement of Science Education, University of Wisconsin—Superior, Superior, WI 54880. (Un; 20; SH; 2, 3)

General Science and Physical Science

(The Multiple Field institutes that are primarily for Junior High School teachers are also listed in this section of the Directory.)

STATE UNIVERSITY OF NEW YORK AT ALBANY, 7 weeks, June 26—August 11: *Intermediate Science Curriculum Study (ISCS);* for teachers of biological and physical sciences. Dr. Thomas A. Boehm, Department of Science Education, The Milne School, State University of New York at Albany, Albany, NY 12203. (Un; 35; JH; 1, 2)

ANTIOCH COLLEGE, 8 weeks, June 26—August 18: *Earth Sciences; Biology; Chemistry; Physics;* for teachers of general science. Dr. James F. Corwin, Department of Chemistry, Antioch College, Yellow Springs, OH 45387. (Seq; 0/55; JH; 2, 3, 4)

UNIVERSITY OF ARKANSAS AT MONTICELLO, 8 weeks, June 12—August 4: *Survey of Earth Science; Survey of Physics;* for teachers of earth science, general science, and physical science. Prof. Joe M. Guenter, Department of Physical Science, University of Arkansas at Monticello, Monticello, AR 71655. (Un; 30; JH; 0)

BETHANY COLLEGE, 6 weeks, June 25—August 4: *Introductory Physical Science (IPS);* for teachers of general science and physical science. Dr. John A. Spence, Box 266, Bethany, WV 26032. (Un; 40; JH; 1, 2)

BROOKLYN COLLEGE, 6 weeks, July 5—August 15: *Basic Principles of Physics and Astronomy; Selected Topics in Modern Physics and Interdisciplinary Science;* primarily for teachers of general science from the local metropolitan area. Prof. Alvin M. Halpern, Department of Physics, Brooklyn College, Brooklyn, NY 11210. (Un*; 40; JH; 0, 1)

CHRISTIAN BROTHERS COLLEGE, 8 weeks, June 19—August 11: *Inquiry Approach in Physical Science (IPS, ISCS, TSM);* for teachers of general science and physical science. Prof. Edward Doody, F.S.C., Department of Science and Mathematics, Christian Brothers College, Memphis, TN 38104. (Un; 40; JH; 0, 1)

EAST CAROLINA UNIVERSITY, 4 or 8 weeks, June 26—August 18: *Introductory Physical Science (IPS)* (4 weeks); *Physical Science II (Continuation of IPS)* (4 weeks); for teachers of physical science. Dr. Moses M. Sheppard, Department of Science Education, East Carolina University, P.O. Box 2792, Greenville, NC 27834. (Un; 40; JH, SH; 2, 3)

EAST TEXAS STATE UNIVERSITY, 9 weeks, June 12—August 15: *Principles of Physical Science;* for teachers of physical science and earth science. Prof. Charles S. Rohrer, Department of Chemistry, East Texas State University, Commerce, TX 75428. (Seq; 0/40; JH; 1, 2)

ELIZABETH CITY STATE UNIVERSITY and EAST CAROLINA UNIVERSITY, 6 weeks, June 12—July 21: *Physical Science;* for North Carolina teachers of physical science. Dr. Louise Sutton, Elizabeth City State University, Box 86, Elizabeth City, NC 27909. (Un*; 40; JH; 0, 1)

FLORIDA STATE UNIVERSITY, 6 weeks, June 19—July 28: *Intermediate Science Curriculum Study (ISCS);* for teachers of science. Dr. Paul Westmeyer, Department of Science Education, Florida State University, Tallahassee, FL 32306. (Un; 35; JH; 2, 3)

GEORGE PEABODY COLLEGE, 8 weeks, June 19—August 11: *Intermediate Science Curriculum Study (ISCS); Project Physics Course; Fundamentals of Chemistry; Seminar;* for teachers of general science. Dr. Gus Tomlinson, Department of Biology, Box 153, George Peabody College, Nashville, TN 37203. (Un; 20; JH, SH; 0, 1, 2)

KANSAS STATE UNIVERSITY, 7 weeks, June 15—August 2: *Intermediate Science Curriculum Study (ISCS—Level I);* for teachers of general science. Dr. Robert K. James, College of Education, Kansas State University, Manhattan, KS 66502. (Un; 40; JH; 1, 2)

LAMAR UNIVERSITY, 6 weeks, July 3—August 11: *Introductory Physics and Astronomy;* for teachers of general science and physical science. Dr. Carl J. Rigney, Lamar University, Box 10046, Lamar University Station, Beaumont, TX 77710. (Un; 40; JH, SH; 0, 1)

LOYOLA UNIVERSITY, 6 weeks, July 5—August 15: *Introductory Physical Science (IPS);* for teachers of general science. Rev. F. A. Benedetto, S.J., Loyola University, Box 47B, Loyola University, New Orleans, LA 70118. (Un; 20; JH; 3)

MURRAY STATE UNIVERSITY, 8 weeks, June 12—August 4: *Principles of Chemistry; General Geology; Astronomy-Meteorology Principles; Fundamentals of Physics;* for teachers of general science. Dr. Walter E. Blackburn, Murray State University, Murray, KY 42071. (Un; 40; JH, SH; 0)

NEBRASKA WESLEYAN UNIVERSITY, 4 or 8 weeks, June 12—August 4: *Introductory Physical Science (IPS)* (4 weeks); *Physical Science II (Continuation of IPS)* (4 weeks); for teachers of general science and physical science. Dr. Walter R. French, Jr., Department of Physics, Nebraska Wesleyan University, Lincoln, NB 68504. (Un; 40; JH, SH; 1, 2)

NORTHERN MICHIGAN UNIVERSITY, 6 weeks, June 26—August 4: *Introductory Physical Science (IPS);* for teachers of general science and physical science. Dr. R. V. Allenstein, Department of Chemistry, Northern Michigan University, Marquette, MI 49855. (Un; 24; JH, SH; 0, 1, 2)

OHIO WESLEYAN UNIVERSITY, 8 weeks, June 19—August 11: *Intermediate Astronomy; Organic Chemistry; Mineralogy and Petrology; Physics and Waves;* for teachers of general science. Dr. Leonard N. Russell, Department of Physics, Ohio Wesleyan University, Delaware, OH 43015. (Seq; 0/35; JH; 2)

THE PENNSYLVANIA STATE UNIVERSITY, 6 weeks, June 26—August 4: *Intermediate Science Curriculum Study (ISCS);* for teachers of science. Dr. Paul E. Bell, Division of Academic Curriculum and Instruction, The Pennsylvania State University, University Park, PA 16802. (Un; 40; JH; 0)

STATE UNIVERSITY COLLEGE AT POTSDAM, 6 weeks, July 3—August 11: *Biology; Chemistry; Earth Sciences; Physics;* for teachers of general science. Dr. Alexander G. Major, Department of Chemistry, State University College, Potsdam, NY 13676. (Un; 45; JH; 0, 1)

ST. CLOUD STATE COLLEGE, 6 weeks, July 3—August 11: *Principles of Physics; Environmental Biology;* for teachers of science. Dr. Harold Hopkins, Department of Biology, St. Cloud State College, St. Cloud, MN 56301. (Un; 40; JH, SH; 0, 1)

SAN DIEGO STATE COLLEGE, 4 weeks, June 26—July 21: *Introductory Physical Science (IPS);* for teachers of physical science. Dr. Louis E. Smith, Jr., Department of Physics, San Diego State College, San Diego, CA 92115. (Un; 40; JH, SH; 2)

SAN DIEGO STATE COLLEGE, 4 weeks, July 24—August 18: *Physical Science II (Continuation of IPS);* for teachers of physical science. Dr. Louis E. Smith, Jr., Department of Physics, San Diego State College, San Diego, CA 92115. (Un; 40; JH, SH; 2)

SOUTHERN OREGON COLLEGE, 8 weeks, June 26—August 18: *Biology; Geology; Geography;* for teachers of biological and earth sciences. Dr. William B. Purdom, Division of Science-Mathematics, Southern Oregon College, Ashland, OR 97520. (Un; 35; JH, SH; 0, 1)

SOUTHWESTERN STATE COLLEGE, 8 weeks, June 5—July 28: *Principles of Chemistry in Earth Sciences, Biological Sciences, and Physical Sciences; Seminar in General Science;* for teachers of general science. Dr. Donald I. Hamm, Department of Chemistry, Southwestern State College, Weatherford, OK 73096. (Un; 40; JH; 0, 1)

SYRACUSE UNIVERSITY, 6 weeks, June 26—August 4: *Intermediate Science Curriculum Study (ISCS);* for teachers of science. Dr. John F. Schaff, Center for Science Education, Syracuse University, Syracuse, NY 13210. (Un; 40; JH; 2, 3)

THE UNIVERSITY OF TEXAS AT AUSTIN, 9 weeks, June 5—August 8: *Biology; Earth Sciences; Physical Sciences;* for teachers of science. Dr. Addison E. Lee, Science Education Center, Education Annex F-13, The University of Texas, Austin, TX 78712. (Un; 40; JH, SH; 0, 1)

UNIVERSITY OF VIRGINIA, 6 weeks, July 10—August 18: *Intermediate Science Curriculum Study (ISCS);* for teachers of science. Dr. Ertle Thompson, NSF Institutes, Peabody Hall Annex, University of Virginia, Charlottesville, VA 22903. (Un; 30; JH; 0, 1)

WAYNE STATE UNIVERSITY, 8 weeks, June 26—August 16: *Introductory Physical Science (IPS);* for local teachers of general science and physical science. Dr. Henry O. Hooper, Department of Physics, Wayne State University, Detroit, MI 48202. (Un; 48; JH, SH; 0, 1)

UNIVERSITY OF WISCONSIN—SUPERIOR, 8 weeks, June 12—August 4: *Intermediate Science Curriculum Study (ISCS);* for teachers of general science. Dr. Myron O. Schneiderwent, Center for the Advancement of Science Education, University of Wisconsin—Superior, Superior, WI 54880. (Un; 35; JH; 2, 3)

UNIVERSITY OF WISCONSIN—SUPERIOR, 8 weeks, June 12—August 4: *Physical Science (IPS and PS II);* for teachers of physical science. Dr. Howard M. Thomas, Center for the Advancement of Science Education, University of Wisconsin—Superior, Superior, WI 54880. (Un; 35; JH; 2, 3)

Mathematics

ADELPHI UNIVERSITY, 6 weeks, July 3—August 12: *Topics in Geometry; Theory of Numbers; Introduction to Game Theory and Linear Programming; History of Mathematics;* for teachers of mathematics. Prof. Eugene Levine, Department of Mathematics, Adelphi University, Garden City, NY 11530.
(Seq*; 0/60; JH, SH; 4)

UNIVERSITY OF ARIZONA, 8 weeks, June 19—August 12: *SSMCIS Mathematics; Modern Algebra; Modern Geometry; Vector Geometry; Seminar;* for teachers of mathematics. Dr. Arthur H. Steinbrenner, Department of Mathematics, University of Arizona, Tucson, AZ 85721.
Seq; 0/48; JH, SH; 2, 3)

UNIVERSITY OF ARKANSAS (see Comprehensive Projects, page 56).

AUBURN UNIVERSITY, 8 weeks, June 13—August 8: *Algebra; Analysis; The Number System; Mathematics of Computation;* for teachers of mathematics. Dr. R. K. Butz, Department of Mathematics, Auburn University, Auburn, AL 36830. (Seq; 0/42; SH; 1, 2)

BALL STATE UNIVERSITY, 8 weeks, June 19—August 11: *Foundations of Mathematics; Geometry; Seminar;* for teachers of mathematics in grades 7-9, ages 35-55. Dr. Roy L. McCormick, Department of Mathematical Sciences, Ball State University, Muncie, IN 47306.
(Seq; 0/30; JH; 1)

BOSTON COLLEGE, 6 weeks, June 26—August 4: *Abstract Algebra; Vector Algebra and Geometry;* for teachers of mathematics. Prof. Stanley J. Bezuszka, S. J., Department of Mathematics, Boston College, Chestnut Hill, MA 02167.
(Seq; 0/37; JH, SH; 2)

BOWDOIN COLLEGE, 6 weeks, June 26—August 4: *Geometric Transformations; Advanced Mathematics for Use in Secondary Schools;* for teachers of mathematics. Prof. Richard L. Chittim, 104 Seth Adams Hall, Bowdoin College, Brunswick, ME 04011. (Seq; 0/54; SH; 4)

BOWLING GREEN STATE UNIVERSITY, 11 weeks, June 19—August 30: *Real Analysis; Projective Geometry; Foundations; Topology; Probability and Statistics;* for teachers of mathematics. Dr. W. A. Kirby, Department of Mathematics, Bowling Green State University, Bowling Green, OH 43403. (Seq; 0/25; JH, SH; 4, 5)

STATE UNIVERSITY OF NEW YORK AT BUFFALO, 6 weeks, June 26—August 4: *Number Theory; Probability and Statistics; Demonstration Class;* for teachers of mathematics. Prof. Stephan R. Cavior, Department of Mathematics, State University of New York at Buffalo, 4246 Ridge Lea Rd., Buffalo, NY 14226. (Seq; 0/34; JH, SH; 3, 4)

UNIVERSITY OF CALIFORNIA, SANTA BARBARA, 8 weeks, June 19—August 11: *Basic Topology and Convexity; Linear Algebra and Linear Transformations; Computers; Research Designs in Mathematical Learning;* for teachers of mathematics. (Director: Dr. William H. Meyer, University of Chicago.) Write: Prof. Adil Yaqub, Department of Mathematics, University of California, Santa Barbara, CA 93106. (Seq; 0/49; SH; 3)

THE CATHOLIC UNIVERSITY OF AMERICA, 6 weeks, June 26—August 4: *Higher Algebra; Foundations of Geometry; Intermediate Analysis; Probability and Statistics;* for teachers of mathematics. Prof. Raymond W. Moller, Department of Mathematics, The Catholic University of America, Washington, DC 20017. (Seq; 0/36; JH, SH; 2, 3)

CLARKE COLLEGE, 6 weeks, June 19—July 28: *Introduction to Computer Sciences; Computer-Extended Instruction in Mathematics;* for teachers of mathematics. Sister Mary Kenneth Keller, Department of Computer Sciences, Clarke College, Dubuque, IA 52001. (Un; 30; SH; 4, 5)

COLORADO STATE UNIVERSITY, 8 weeks, June 12—August 4: *Advanced Calculus; Modern Algebra; Modern Geometry; Seminar in Modern Curriculum;* for teachers of mathematics. Dr. Richard Painter, Department of Mathematics, Colorado State University, Fort Collins, CO 80521. (Seq; 0/40; SH; 3, 4)

COLUMBIA UNIVERSITY, 6 weeks, July 3—August 11: *SSMCIS Mathematics;* for 10th and 11th grade mathematics teachers. Dr. Bruce R. Vogeli, Department of Mathematical Education, Teachers College, Columbia University, New York, NY 10027. (Un; 40; SH; 3, 4)

UNIVERSITY OF CONNECTICUT, 6 weeks, July 3—August 11: *Mathematics (UICSM Courses);* for teachers of mathematics. Prof. Martin S. Wolfe, Mathematics Education Center, Box U-7, University of Connecticut, Storrs, CT 06268. (Un; 40; JH, SH; 0, 1, 2, 3)

UNIVERSITY OF DAYTON, 7 weeks, June 19—August 4: *Probability and Statistics; Statistics with Computer Applications; Abstract Algebra; Analysis;* for teachers of mathematics. Dr. H. G. Mushenheim, Department of Mathematics, University of Dayton, Dayton, OH 45409. (Seq; 0/47; SH; 3, 4)

DEPAUW UNIVERSITY, 6 weeks, June 25—August 4: *Mathematical Analysis; Introduction to Time-Shared Computing; Problem Seminar;* for teachers of advanced placement mathematics. Dr. Clinton B. Gass, Department of Mathematics, DePauw University, Greencastle, IN 46135. (Un; 36; SH; 2, 3, 4)

UNIVERSITY OF DETROIT, 6 weeks, June 26—August 5: *Algebra; Calculus; Geometry; Probability and Statistical Inference; Theory of Numbers; Theory of Functions;* for teachers of mathematics. Dr. Lyle E. Mehlenbacher, Department of Mathematics, Graduate School, University of Detroit, Detroit, MI 48221. (Seq*; 0/45; JH, SH; 1, 2)

DRAKE UNIVERSITY, 8 weeks, June 12—August 4: *Number Theory; Real Analysis; Numerical Analysis; Seminar in Teaching Problems;* for teachers of mathematics. Dr. Wayne L. Woodworth, Department of Mathematics, Drake University, Des Moines, IA 50311. (Seq; 0/40; SH; 3)

DREW UNIVERSITY, 6 weeks, July 3—August 11: *Mathematics (SSMCIS); Computers and the High School Curriculum; Vector Analytic Geometry and Calculus; Probability;* for teachers of mathematics. Dr. Bernard Greenspan, Department of Mathematics, Drew University, Madison, NJ 07940. (Un; 40; JH, SH; 2)

DREXEL UNIVERSITY, 6 weeks, July 3—August 11: *College Mathematics with Business Applications; Curriculum and Instruction;* for teachers of general and business mathematics. Dr. Ewaugh F. Fields, Department of Mathematics, Drexel University, Philadelphia, PA 19104.
(Un; 30; JH, SH; 0, 1, 2)

EMORY UNIVERSITY, 7 weeks, June 19—August 4: *Numerical Analysis; Automata Theory; Probability and Statistical Inference; Matrices and Linear Transformations; Topics in Algebra; Mathematical Analysis;* for teachers of mathematics. Prof. John P. Downes, Department of Mathematics, Emory University, Atlanta, GA 30322.
(Seq; 0/40; SH; 3, 4)

UNIVERSITY OF FLORIDA, 8 weeks, June 18—August 11: *Introduction to Number Systems; Geometry and Measurement;* for teachers of mathematics. Dr. Charles W. Nelson, Department of Mathematics, University of Florida, Gainesville, FL 32601. (Un; 40; JH; 1, 2)

FORDHAM UNIVERSITY, 6 weeks, July 5—August 15: *Introduction to Analysis; Fundamental Concepts of Mathematics; Introduction to Topology; Introduction to Computing;* for teachers of mathematics. Rev. Edward W. Brande, S.J., Department of Mathematics, Fordham University, Bronx, NY 10458.
(Seq*; 0/50; JH, SH; 2, 3, 4)

FRESNO STATE COLLEGE, 8 weeks, June 19—August 11: *Linear Algebra; Probability; Game Theory and Linear Programming; Intermediate Analysis;* for teachers of mathematics. Prof. A. E. Labarre, Jr., Department of Mathematics, Fresno State College, Fresno, CA 93710.
(Seq; 0/30; JH, SH; 0, 2)

GRAMBLING COLLEGE, 9 weeks, June 19—August 18: *Basic Analysis; Probability and Statistics; Geometry; Seminar;* for teachers of mathematics. Dr. Samuel H. Douglas, Department of Mathematics, Grambling College, Grambling, LA 71245. (Un; 30; JH, SH; 0)

HAMILTON COLLEGE, 6 weeks, July 3—August 11: *Nontraditional Geometry; Probability and Statistics; Seminar in Curriculum Problems and Applications;* for teachers of mathematics. Prof. Brewster H. Gere, Department of Mathematics, Hamilton College, Clinton, NY 13323. (Un; 40; JH, SH; 1, 2, 3)

HOPE COLLEGE, 7 weeks, June 26—August 11: *Topics in Real Analysis;* for teachers of advanced placement mathematics. Dr. Jay E. Folkert, Department of Mathematics, Hope College, Holland, MI 49423. (Un; 40; SH; 4)

UNIVERSITY OF ILLINOIS, 4 weeks, June 26—July 21: *UICSM Course: Junior High Mathematics for Underachievers;* for teachers of mathematics. Mr. Russell E. Zwoyer, UICSM, 1210 West Springfield, Urbana, IL 61801. (Un; 90; JH; 0, 1, 2, 3, 4)

UNIVERSITY OF ILLINOIS, 6 weeks, June 26—August 4: *UICSM Course: Algebra;* for teachers of mathematics. Mr. Russell E. Zwoyer, UICSM, 1210 West Springfield, Urbana, IL 61801. (Un; 30; JH, SH; 0, 1, 2, 3, 4)

INDIANA UNIVERSITY, 8 weeks, June 26—August 18: *Introduction to Modern Geometry; Introduction to Probability;* for teachers of mathematics. Mrs. Marie S. Wilcox, Department of Mathematics, Indiana University, Bloomington, IN 47401. (Seq; 0/35; SH; 4, 5)

KANSAS STATE UNIVERSITY, 8 weeks, June 5—July 28: *Geometry; Introduction to Modern Algebra; Set Theory and Logic;* for teachers of mathematics. Dr. Leonard E. Fuller, Department of Mathematics, Physical Science Building, Kansas State University, Manhattan, KS 66502. (Seq; 10/40; JH, SH; 2)

KENT STATE UNIVERSITY, 8 weeks, June 19—August 11: *Geometry; Algebra; Modern Mathematics;* for teachers of mathematics. Dr. Kenneth B. Cummins, Department of Mathematics, Kent State University, Kent, OH 44242. (Un; 40; SH; 2, 3)

LEHIGH UNIVERSITY, 6 weeks, June 19—July 28: *Probability and Statistics; Higher Algebra; Higher Geometry; Intermediate Analysis;* for teachers of mathematics. Dr. Douglas H. Taylor, Department of Mathematics, Lehigh University, Bethlehem, PA 18015. (Un; 40; SH; 3, 4)

LOUISIANA STATE UNIVERSITY, 9 weeks, June 9—August 11: *Vector Spaces; Linear Programming; Probability-Statistics;* for teachers of mathematics. Dr. Benjamin E. Mitchell, Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803.
(Seq; 0/29; SH; 4, 5)

UNIVERSITY OF MAINE, 6 weeks, July 10—August 18: *Elementary Number Theory; Geometry; Analysis; Curriculum Seminar;* for teachers of mathematics. Dr. John C. Mairhuber, Department of Mathematics, University of Maine, Orono, ME 04473.
(Seq*; 0/40; JH, SH; 1, 2, 3)

MARQUETTE UNIVERSITY, 6 weeks, June 26—August 4: *Mathematical Analysis; Topics in Complex Analysis; History of Mathematical Ideas;* for teachers of mathematics. (Director: Dr. Miriam E. Connellan, Marquette University.) Write: Dr. Thomas A. Bronikowski, Department of Mathematics, Marquette University, Milwaukee, WI 53233. (Seq; 0/40; JH, SH; 4)

UNIVERSITY OF MARYLAND, 6 weeks, June 26—August 4: *Mathematics Topics from SSMCIS Curriculum;* for teachers of mathematics. Prof. James Fey, University of Maryland Mathematics Project, University of Maryland, College Park, MD 20742. (Un; 40; JH, SH; 3, 4, 5)

MICHIGAN STATE UNIVERSITY, 6 weeks, June 19—July 28: *Algebra; Geometry; Foundations of Mathematics;* for teachers of mathematics. Dr. John Wagner, Science and Mathematics Teaching Center, Michigan State University, East Lansing, MI 48823.
(Un; 40; JH; 3, 4, 5)

UNIVERSITY OF MONTANA, 9 weeks, June 19—August 18: *Modern Algebra; Principles of Analysis; Probability and Statistics; Computer Methods; Modern Geometry;* for teachers of mathematics. Dr. William M. Myers, Department of Mathematics, University of Montana, Missoula, MT 59801. (Seq; 0/35; JH, SH; 3, 4)

MONTCLAIR STATE COLLEGE, 6 weeks, June 26—August 4: *Calculus; Mathematics Materials for Teachers;* for teachers of mathematics. Dr. Evan M. Maletsky, Department of Mathematics, Montclair State College, Upper Montclair, NJ 07043. (Seq; 0/20; JH, SH; 1)

MONTCLAIR STATE COLLEGE, 6 weeks, June 26—August 4: *Advanced Calculus; Linear Algebra; Mathematics Materials for Teachers;* for teachers of mathematics. Dr. Evan M. Maletsky, Department of Mathematics, Montclair State College, Upper Montclair, NJ 07043. (Seq; 0/35; JH, SH; 4)

UNIVERSITY OF NEBRASKA, 8 weeks, June 5—July 28: *Mathematical Logic and Set Theory; Topology; Number Theory; Advanced Geometry; Abstract Algebra; Advanced Calculus;* for teachers of mathematics. Dr. Hubert H. Schneider, 934 Oldfather Hall, Department of Mathematics, University of Nebraska, Lincoln, NB 68508. (Seq; 0/28; SH; 2, 3, 4)

UNIVERSITY OF NEW HAMPSHIRE, 8 weeks, June 19—August 11: *Algebra; Geometry; History of Mathematics; Mathematics and Computing;* for teachers of mathematics. Dr. Richard H. Balomenos, Department of Mathematics, Kingsbury Hall, University of New Hampshire, Durham, NH 03824. (Seq; 0/48; JH, SH; 1, 2)

THE UNIVERSITY OF NEW MEXICO, 8 weeks, June 10—August 4: *Introductory Analysis; History of Mathematics; Linear Algebra; Seminars;* for teachers of mathematics. Dr. Merle Mitchell, Department of Mathematics, The University of New Mexico, Albuquerque, NM 87106. (Seq; 0/45; SH; 2, 3)

NORTHERN ILLINOIS UNIVERSITY, 8 weeks, June 13—August 4: *Basic Concepts of Modern Mathematics; Number Systems; Geometry; Use of the Computer in School Mathematics;* for teachers of mathematics. Dr. Merlyn J. Behr, Department of Mathematics, Northern Illinois University, DeKalb, IL 60115. (Un; 40; JH; 0, 1)

NORTH GEORGIA COLLEGE, 9 weeks, June 12—August 11: *The Computer; Probability and Statistics; Linear Algebra;* for teachers of mathematics from Georgia and adjacent states. Dr. William G. Roughead, Department of Mathematics, North Georgia College, Dahlonega, GA 30533. (Un; 30; SH; 0, 1, 2)

UNIVERSITY OF NOTRE DAME (see Comprehensive Projects, page 56).

THE OHIO STATE UNIVERSITY, 8 weeks, June 19—August 12: *Analysis; Topology;* for teachers of mathematics. Prof. John Riner, Department of Mathematics, 231 W. 18th Ave., The Ohio State University, Columbus, OH 43210. (Seq; 0/64; IH, SH; 3, 4, 5)

OHIO UNIVERSITY, 8 weeks, June 26—August 19: *Abstract Algebra; Statistics; Seminar;* for teachers of mathematics. Dr. Paul S. Malcom, Department of Mathematics, Ohio University, Athens, OH 45701. (Seq; 0/34; SH; 4, 5)

UNIVERSITY OF OKLAHOMA, 8 weeks, June 1—July 29: *College Geometry; Linear Algebra; Seminar in Geometry; Seminar in Algebra; Foundations of Analysis;* for teachers of mathematics. Dr. Gene Levy, Department of Mathematics, University of Oklahoma, Norman, OK 73069. (Seq; 20/40; JH, SH; 3, 4)

UNIVERSITY OF OREGON, 8 weeks, June 19—August 11: *Introduction to Computer Programming; Problem Solving via Computers; Numerical Analysis; Advanced Programming; Instructional Use of Computers;* for Oregon teachers of mathematics and computer science. Dr. David G. Moursund, Department of Computer Science, University of Oregon, Eugene, OR 97403. (Un; 40; JH, SH; 1, 2, 3, 4)

UNIVERSITY OF OREGON, 8 weeks, June 19—August 11: *Geometry; Combinatorial Analysis; Logic and Set Theory; Analysis; Complex Variable Theory; Introduction to Algebraic Systems; Curriculum Seminar;* for Oregon teachers of mathematics. Prof. A. F. Moursund, Department of Mathematics, University of Oregon, Eugene, OR 97403. (Seq*; 0/40; JH, SH; 2, 3, 4)

OREGON STATE UNIVERSITY, 8 weeks, June 19—August 11: *Finite Mathematics; Foundations of Geometry; Abstract Algebra; Advanced Calculus; Computer Programming and Operations; Modern Mathematics Curricula;* for teachers of mathematics. Prof. W. H. Simons, Department of Mathematics, Oregon State University, Corvallis, OR 97331. (Seq; 0/25; JH, SH; 3, 4)

THE PENNSYLVANIA STATE UNIVERSITY (see Institutes for Supervisors, page 52).

UNIVERSITY OF PUERTO RICO, CAYEY, 7 weeks, June 5—July 21: *Algebra; Modern Mathematics; Geometry; Theory of Numbers; Probability and Statistics;* for teachers of mathematics and science. Dr. Mariano García, Department of Mathematics, University of Puerto Rico, Cayey, PR 00633.
(Un; 40; JH, SH; 0, 1, 2)

PURDUE UNIVERSITY, 8 weeks, June 19—August 11, at Calumet Campus, Hammond, Ind.: *Theory of Numbers; Teaching of Algebra;* for local teachers of mathematics. Dr. Robert D. Bechtel, Mathematics Section, Purdue University Calumet Campus, Hammond, IN 46323.
(Seq*; 25/50; JH, SH; 3, 4)

PURDUE UNIVERSITY, 8 weeks, June 12—August 4, at Fort Wayne Campus, Fort Wayne, Ind.: *Theory of Numbers; Teaching of Geometry;* for local teachers of mathematics. Dr. Robert D. Bechtel, Mathematics Section, Purdue University Calumet Campus, Hammond, IN 46323.
(Seq*; 20/40; JH, SH; 3, 4)

PURDUE UNIVERSITY, 6 weeks, July 5—August 17, at IUPU Indianapolis Campus, Indianapolis, Ind.: *Analysis for Teachers;* for local teachers of mathematics. Dr. Robert D. Bechtel, Mathematics Section, Purdue University Calumet Campus, Hammond, IN 46323.
(Seq*; 25/50; JH, SH; 3, 4)

PURDUE UNIVERSITY, 8 weeks, June 19—August 11: *Algebra; Analysis; Geometry; Logic;* for teachers of mathematics. Dr. G. H. Wheatley, Division of Mathematical Sciences, Purdue University, Lafayette, IN 47907.
(Seq; 0/35; JH, SH; 3, 4)

RUTGERS—THE STATE UNIVERSITY, 8 weeks, June 22—August 16: *Advanced Topics in Calculus; Linear Algebra; Foundations of Geometry;* for teachers of mathematics. (Director: Dr. Joshua Barlaz, Rutgers University.) Write: Dr. A. Angus Austen, Director of Summer Session, Rutgers University, New Brunswick, NJ 08903. (Seq; 0/50; JH, SH; 3, 4, 5)

SAINT LOUIS UNIVERSITY, 6 weeks, June 20—July 28: *Computer Programming; Geometric Transformations; Linear Algebra; Probability and Statistics; Media Workshop;* for teachers of mathematics. Dr. John J. Andrews, Department of Mathematics, Saint Louis University, St. Louis, MO 63103. (Seq; 0/25; JH, SH; 2, 3, 4)

SAN DIEGO STATE COLLEGE, 7 weeks, June 26—August 11: *Elementary Analysis; Modern Algebra; Modern Geometry; Probability and Statistics;* for teachers of mathematics. Dr. Gerald A. Becker, Department of Mathematics, San Diego State College, San Diego, CA 92115. (Un; 40; JH, SH; 1, 2)

UNIVERSITY OF SAN FRANCISCO, 6 weeks, June 15—July 29: *Algebra; Geometry; Introduction to Probability;* for teachers of mathematics. Prof. Edward J. Farrell, Department of Mathematics, University of San Francisco, San Francisco, CA 94117. (Un; 40; JH, SH; 0, 1, 2)

SAN JOSE STATE COLLEGE (see Comprehensive Projects, page 56).

UNIVERSITY OF SANTA CLARA, 6 weeks, June 26—August 4: *Seminar in Problem Solving; Probability and Statistics; Numerical Analysis; Topics in Analysis; Sequences and Series;* for teachers of mathematics. Prof. L. F. Klosinski, Department of Mathematics, University of Santa Clara, Santa Clara, CA 95053. (Seq*; 0/40; SH; 2, 3)

UNIVERSITY OF SOUTH CAROLINA, 8 weeks, June 19—August 11: *Linear Algebra; Foundations of Geometry;* for teachers of mathematics. (Director: Dr. J. H. Wahab, University of South Carolina.) Write: Dr. R. A. Lytle, Department of Mathematics, University of South Carolina, Columbia, SC 29208. (Un; 25; SH; 3)

UNIVERSITY OF SOUTH DAKOTA, 8 weeks, June 12—August 8: *Introduction to Modern Algebra; Introduction to Modern Geometry; Seminar;* for teachers of mathematics. Prof. Wm. E. Ekman, Department of Mathematics, University of South Dakota, Vermillion, SD 57069.
(Seq; 0/24; SH; 3, 4)

SOUTHEASTERN STATE COLLEGE, 8 weeks, June 12—August 4: *Geometry; Elementary Functions; The Mathematics Curriculum, Grades 7-12;* for teachers of mathematics. Dr. Leslie A. Dwight, Department of Mathematics, Southeastern State College, Durant, OK 74701.
(Seq; 0/42; JH, SH; 2, 3)

UNIVERSITY OF SOUTHERN CALIFORNIA, 7 weeks, June 26—August 12: *Mathematical Topics and Seminar Based on SSMCIS Texts;* for teachers of mathematics. Prof. Paul A. White, Department of Mathematics, University of Southern California, University Park, Los Angeles, CA 90007. (Un; 40; JH, SH; 3)

SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, 8 weeks, June 19—August 11: *Seminar in Mathematics Education;* for teachers of mathematics. Prof. W. C. McDaniel, Department of Mathematics, Southern Illinois University, Carbondale, IL 62901.
(Seq; 0/14; SH; 2, 3)

SOUTHERN OREGON COLLEGE, 8 weeks, June 19—August 11: *Modern Geometry; Logic and Proof in Geometry; A Transformational Approach to Geometry; Seminar on Geometry Curriculum;* for Oregon teachers of mathematics. Mr. Robert A. McCoy, Department of Mathematics, Southern Oregon College, Ashland, OR 97520. (Un; 40; JH, SH; 1, 2, 3)

SOUTHWESTERN STATE COLLEGE, 8 weeks, June 5—July 28: *Foundations of Mathematics; Geometry; Seminar; Mathematics Laboratory;* for teachers of mathematics. Dr. Raymond L. McKellips, Department of Mathematics, Southwestern State College, Weatherford, OK 73096.
(Un; 40; JH; 0, 1)

STANFORD UNIVERSITY, 6 weeks, June 26—August 4: *Introduction to Higher Geometry; Introduction to Analysis; Problem Solving in Algebra; Recent Developments in Secondary School Mathematics;* for teachers of mathematics. Prof. Harold M. Bacon, NSF Institute, Box 5068, Stanford, CA 94305. (Seq; 50/50; SH; 3, 4)

SYRACUSE UNIVERSITY, 6 weeks, June 28—August 8: *Axiomatic Organization of School Mathematics; Numerical Analysis and Programming; Seminar;* for teachers of mathematics. Prof. Robert M. Exner, Department of Mathematics, 15F Smith Hall, Syracuse University, Syracuse, NY 13210. (Seq; 0/34; JH, SH; 4, 5)

TULANE UNIVERSITY, 7 weeks, June 12—July 28: *Real Analysis; Modern Algebra; Probability and Statistics; Geometry;* for teachers of mathematics. Dr. Frank D. Quigley, Department of Mathematics, Tulane University, New Orleans, LA 70118. (Seq; 0/41; SH; 3, 4)

UTAH STATE UNIVERSITY, 8 weeks, June 19—August 11: *Modern Algebra; Metric Geometry; Applications of Mathematical Analysis; Computer Oriented Calculus;* for teachers of advanced placement mathematics. Dr. Neville C. Hunsaker, Department of Mathematics, Utah State University, Logan, UT 84321.
(Seq; 0/45; SH; 3, 4)

UNIVERSITY OF VERMONT, 7 weeks, June 26—August 11: *Elementary Functions; Calculus; Statistics and Probability; Foundations of Geometry;* for teachers of mathematics. Dr. N. James Schoonmaker, Department of Mathematics, University of Vermont, Burlington, VT 05401.
(Seq; 0/50; SH; 0, 1)

WASHINGTON STATE UNIVERSITY, 8 weeks, June 19—August 11: *Elementary Modern Algebra; Elementary Probability Theory;* for teachers of mathematics. Dr. Calvin T. Long, Department of Mathematics, Washington State University, Pullman, WA 99163.
(Seq; 0/29; JH; 1)

WASHINGTON STATE UNIVERSITY, 8 weeks, June 19—August 11: *Algebra; Geometry; Analysis;* for teachers of mathematics. Dr. H. C. Wiser, Department of Mathematics, Washington State University, Pullman, WA 99163.
(Seq; 0/25; SH; 3, 4)

WAYNE STATE UNIVERSITY, 8 weeks, June 26—August 18: *Linear Algebra; Calculus; Probability; UICSM and SMSG Programs;* for teachers of mathematics. Dr. Harold T. Slaby, Department of Mathematics, Wayne State University, Detroit, MI 48202.
(Seq*; 0/50; JH, SH; 3)

WESTERN MICHIGAN UNIVERSITY, 8 weeks, June 26—August 18: *Intermediate Analysis; Survey of Algebra; Curriculum Studies in Algebra and Geometry; Seminar in Mathematics Education;* for teachers of mathematics. Dr. A. Bruce Clarke, Department of Mathematics, Western Michigan University, Kalamazoo, MI 49001.
(Seq; 0/50; SH; 3)

WESTERN WASHINGTON STATE COLLEGE, 6 weeks, June 26—August 4: *UICSM Vector Geometry; Curriculum Development;* for teachers of mathematics. Prof. Harvey M. Gelder, Department of Mathematics, Western Washington State College, Bellingham, WA 98225.
(Un; 40; JH, SH; 2, 3, 4, 5)

WESTERN WASHINGTON STATE COLLEGE, 9 weeks, June 19—August 18: *Abstract Algebra; Analysis; Computer Science; Mathematics Education Seminar;* for teachers of mathematics. Dr. Keith J. Craswell, Department of Mathematics, Western Washington State College, Bellingham, WA 98225. (Seq; 0/11; SH; 3, 4, 5)

WEST VIRGINIA UNIVERSITY, 7 weeks, June 19—August 5: *Number Systems and Real Algebra; Geometry and Probability;* for teachers of mathematics in the Appalachian area. Dr. Alonzo F. Johnson, Department of Mathematics, West Virginia University, Morgantown, WV 26506. (Un; 40; JH; 1, 2)

COLLEGE OF WILLIAM AND MARY, 8 weeks, June 19—August 11: *Mathematics;* for teachers of science and mathematics. Prof. Benjamin R. Cato, Jr., NSF Summer Institute, Department of Mathematics, College of William and Mary, Williamsburg, VA 23185.
(Seq; 0/35; JH, SH; 1, 2, 3)

Physics

BEMIDJI STATE COLLEGE, 8 weeks, June 19—August 11: *Pro'ect Physics Course;* for teachers of physics. Prof. Wesley Winter, Department of Physics, Bemidji State College, Bemidji, MN 56601. (Un; 30; SH; 2)

STATE UNIVERSITY COLLEGE AT GENESEO, 7 weeks, July 13—August 19: *Project Physics Course;* for teachers of physics. Dr. Robert L. Sells, Department of Physics, State University College, Geneseo, NY 14454. (Un; 40; SH; 1, 2, 3)

COLLEGE OF THE HOLY CROSS, 6 weeks, June 26—August 4: *Optics; Electronics;* for teachers of physics. Dr. Roy C. Gunter, Jr., Department of Physics, College of the Holy Cross, Worcester, MA 01610. (Seq; 30/40; SH; 1, 2)

ILLINOIS INSTITUTE OF TECHNOLOGY, 6 weeks, June 26—August 4: *Physics and the Teaching of Physics;* primarily for teachers of physics and physical science in the Chicago area. Dr. Earl Zwicker, Department of Physics, Illinois Institute of Technology, Chicago, IL 60616. (Un*; 36; SH; 1)

JOHN CARROLL UNIVERSITY, 10 weeks, June 19—August 25: *Astronomy of the Solar System; Stellar Astronomy; Seminar in New Curricula;* for northeastern Ohio teachers of physics. Dr. Harry C. Nash, Department of Physics, John Carroll University, Cleveland, OH 44118. (Seq; 0/24; SH; 2)

LOYOLA UNIVERSITY, 6 weeks, July 5—August 15: *Project Physics Course*; *Advanced Projects in Audio-Visual Techniques for Science Instruction;* for teachers of physics. (Director: Rev. F. A. Benedetto, S.J., Loyola University.) Write: Dr. John F. Christman, Box 47B, Loyola University, New Orleans, LA 70118. (Un; 20; SH; 3)

MANHATTAN COLLEGE, 6 weeks, June 29—August 11: *Solid State Physics;* for teachers of physics and physical sciences. Prof. C. Leonard O'Connor, Department of Physics, Manhattan College, Bronx, NY 10471. (Seq; 0/17; SH; 2, 3)

UNIVERSITY OF MINNESOTA, 8 weeks, June 26—August 18: *Modern Physics and Special Topics; History of 19th and 20th Century Physics; Physics Laboratory; Seminar in Teaching Secondary School Physics;* for teachers of physics. Dr. Russell K. Hobbie, School of Physics and Astronomy, University of Minnesota, Minneapolis, MN 55455. (Seq; 0/29; SH; 2, 3)

STATE UNIVERSITY COLLEGE AT NEW PALTZ, 8 weeks, June 26—August 18: *Electronics for Scientists;* for teachers of physics and chemistry. Dr. Donald A. Walker, Department of Physics, State University College, New Paltz, NY 12561. (Un; 20; SH; 1, 2)

UNIVERSITY OF NOTRE DAME, 7 weeks, June 26—August 11: *Physics;* for teachers of physics. Dr. Robert L. Anthony, Department of Physics, University of Notre Dame, Notre Dame, IN 46556. (Seq; 0/35; SH; 3, 4)

PURDUE UNIVERSITY, 8 weeks, June 19—August 11: *Principles of Physics; Introduction to Theoretical Physics; Topics in Mathematics; Thermal Physics; Survey of Modern Physics; Advanced Physics Experiments; Solid State Physics;* for teachers of physics. Dr. Van E. Neie, Department of Physics, Purdue University, Lafayette, IN 47907. (Seq; 0/86; SH; 4, 5)

RENSSELAER POLYTECHNIC INSTITUTE, 8 weeks, June 26—August 18: *Project Physics Course;* for teachers of physics. (Director: Prof. Walter Eppenstein, Rensselaer Polytechnic Institute.) Write: Dr. M. H. Jordan, Dean of Continuing Studies, Rensselaer Polytechnic Institute, Troy, NY 12181. (Un; 36; SH; 3, 4, 5)

SAN DIEGO STATE COLLEGE, 7 weeks, June 26—August 11: *Project Physics Course;* for teachers of physics. Dr. Norman F. Dessel, Department of Physical Science, San Diego State College, San Diego, CA 92115. (Un; 40; SH; 3)

TRINITY UNIVERSITY, 8 weeks, June 18—August 11: *Project Physics Course;* for teachers of physics. Dr. Rudolph M. Gaedke, Department of Physics, Trinity University, San Antonio, TX 78284. (Un; 30; SH; 0, 1)

UNIVERSITY OF WASHINGTON, 8 weeks, June 19—August 11: *Basic Concepts of Physics (Using PSSC and Project Physics Materials);* for teachers of physics. Dr. Arnold B. Arons, Department of Physics, University of Washington, Seattle, WA 98105. (Un; 40; SH; 1, 2)

UNIVERSITY OF WISCONSIN—MILWAUKEE, 8 weeks, June 19—August 12: *Mechanics; Electricity and Magnetism; Atomic Physics; Mathematical Methods; Advanced Laboratories;* for teachers of physics and mathematics. Prof. Glenn M. Schmieg, Department of Physics, University of Wisconsin—Milwaukee, Milwaukee, WI 53201. (Seq; 0/30; SH; 2, 3, 4)

UNIVERSITY OF WISCONSIN—SUPERIOR, 8 weeks, June 12—August 4: *Project Physics Course;* for teachers of physics. Dr. Gordon O. C. Besch, Center for the Advancement of Science Education, University of Wisconsin—Superior, Superior, WI 54880. (Un; 30; SH; 2, 3)

Radioactivity and Nuclear Science

MONTANA STATE UNIVERSITY, 6 weeks, July 10—August 18: *Principles of Nuclear and Instrumental Chemistry; Curricular Materials;* for teachers of chemistry and physics. Dr. John R. Amend, Department of Chemistry, Montana State University, Bozeman, MT 59715. (Un; 28; SH; 2, 3)

Economics

DREXEL UNIVERSITY, 6 weeks, June 19—July 28: *Economics;* for teachers of economics within commuting distance of Philadelphia. Dr. Robert L. Hamman, Department of Economics, Drexel University, Philadelphia, PA 19104. (Seq*; 0/35; JH, SH; 1, 2)

UNIVERSITY OF ILLINOIS, 8 weeks, June 17—August 12: *Economics;* for teachers of economics. Prof. Donald W. Paden, Department of Economics, University of Illinois, Urbana, IL 61801. (Seq; 0/15; SH; 2)

NORTH TEXAS STATE UNIVERSITY, 6 weeks, June 12—July 21: *Economics;* for teachers of economics. Prof. William A. Luker, Box 5427, North Texas State University, Denton, TX 76203. (Seq; 0/30; SH; 0)

OHIO UNIVERSITY, 5 weeks, June 19—July 21: *Consumer Economics;* for teachers of social sciences. Dr. Roman F. Warmke, Department of Economic Education, Ohio University, Athens, OH 45701. (Un; 40; JH, SH; 0, 1)

OKLAHOMA STATE UNIVERSITY, 8 weeks, June 5—July 28: *Macroeconomic Principles and Problems;* for teachers of economics. Prof. H. P. Kopecky, College of Business, Oklahoma State University, Stillwater, OK 74074. (Un; 40; SH; 1)

SAN JOSE STATE COLLEGE, 6 weeks, June 26—August 4: *Economic Analysis of Contemporary Problems; Analysis of Instruction;* for teachers of social science. Dr. Turley Mings, Economics Education Center, San Jose State College, San Jose, CA 95114. (Un; 40; SH; 0)

Geography

OREGON COLLEGE OF EDUCATION, 8 weeks, June 19—August 11: *Geography;* for teachers of geography. Dr. James W. Gallagher, Department of Social Science, Oregon College of Education, Monmouth, OR 97361. (Un; 40; JH, SH; 0, 1, 2, 3, 4)

WESTERN MICHIGAN UNIVERSITY, 6 weeks, June 26—August 4: *Urban Geography; Seminar in Geography Education;* for teachers of geography expecting to use HSGP materials. Dr. Charles Heller, Department of Geography, Western Michigan University, Kalamazoo, MI 49001. (Un; 40; SH; 4, 5)

Psychology

BEAVER COLLEGE, 8 weeks, June 25—August 19: *Psychology as a Social Science;* for teachers of psychology. Dr. Samuel M. Cameron, Department of Psychology, Beaver College, Glenside, PA 19038. (Un; 40; SH; 1)

Sociology

UNIVERSITY OF GEORGIA, 6 weeks, June 12—July 22: *Advanced Principles of Sociology; Teaching of Secondary School Sociology (SRSS);* for teachers of sociology and social science. Prof. Paul E. Kelly, Department of Sociology, 118A Baldwin Hall, University of Georgia, Athens, GA 30601. (Un; 30; SH; 2, 3, 4)

THE UNIVERSITY OF IOWA, 8 weeks, June 12—August 4: *Social Problems and Social Disorganization; American Society; Curricular Materials (SRSS);* for teachers of sociology and social science. Dr. J. Richard Wilmeth, Department of Sociology, The University of Iowa, Iowa City, IA 52240. (Un; 32; SH; 0, 1)

LOUISIANA STATE UNIVERSITY, 7 weeks, June 12—July 28: *Basic Concepts of Sociology and the Theory of Social Organization; Social Trends and Social Problems; Curricular Materials (SRSS);* for teachers of social science. Dr. Alvin L. Bertrand, Departments of Sociology and Rural Sociology, Louisiana State University, Baton Rouge, LA 70803. (Un; 30; JH, SH; 4)

OREGON COLLEGE OF EDUCATION, 8 weeks, June 19—August 11: *Sociology of Race Relations;* for teachers of social science. Dr. Helen M. Redbird-Selam, Department of Social Science, Oregon College of Education, Monmouth, OR 97361. (Un; 40; JH, SH; 0, 1)

UNIVERSITY OF SANTA CLARA, 6 weeks, June 19—July 28: *Interdisciplinary Program in Sociology and Anthropology;* for teams of 2 to 4 social science teachers. Prof. Joseph R. DeMartini, Department of Sociology, University of Santa Clara, Santa Clara, CA 95053. (Un; 40; SH; 0, 1)

WESTERN MICHIGAN UNIVERSITY, 6 weeks, June 26—August 4: *Sociological Concepts; Exercises in Sociology; Race Relations;* for teachers of sociology and social science. Dr. J. Ross Eshleman, Department of Sociology, Western Michigan University, Kalamazoo, MI 49001. (Un; 40; SH; 0, 1)

Science and Society

UNIVERSITY OF CINCINNATI, 6 weeks, July 10—August 18: *The Population Explosion, An Interdisciplinary Approach;* for teachers of social sciences, biology, and new experimental interdisciplinary courses. Dr. Carl A. Huether, Department of Biology, University of Cincinnati, Cincinnati, OH 45221. (Un; 40; JH, SH; 0, 1, 2)

COLORADO STATE UNIVERSITY, 8 weeks, June 19—August 11: *Technology and Society;* for teachers of social and physical sciences. Prof. Charles C. Britton, Department of Electrical Engineering, Colorado State University, Fort Collins, CO 80521. (Un; 30; JH, SH; 4)

KANSAS STATE UNIVERSITY, 8 weeks, June 25—August 18: *Fundamentals of Ecology and the Power Basis of Society; Power, Society and the Environment;* for teachers of biology and physical science. Dr. Walter Meyer, Nuclear Engineering Department, Kansas State University, Manhattan, KS 66502. (Un; 30; SH; 1)

KNOX COLLEGE, 6 weeks, June 26—August 4: *Interrelationships of Science and Society;* for teachers of biology, chemistry, and physics. Dr. Herbert Priestley, Department of Physics, Knox College, Galesburg, IL 61401. (Un; 40; SH; 3, 4)

UNIVERSITY OF WISCONSIN—MILWAUKEE, 8 weeks, June 19—August 11: *Interdisciplinary Social Science;* for teachers of social science courses in urban problems (or with units in urban problems) from Milwaukee metropolitan area. Dr. Leon M. Schur, Department of Economics, University of Wisconsin—Milwaukee, Milwaukee, WI 53201. (Un; 40; JH, SH; 0, 1)

Interdisciplinary Environmental Studies

BAYLOR UNIVERSITY, 7 weeks, June 26—August 11: *Introduction to Environmental Problems; Physiological Ecology;* for teachers of biology and chemistry. Dr. Virgil Tweedie, Department of Chemistry, Baylor University, Waco, TX 76703. (Un; 40; JH, SH; 2, 3)

THE UNIVERSITY OF IOWA, 8 weeks, June 12—August 4: *Contemporary Problems of Society; Ecological Studies; Pollution Problems; Seminar in Interdisciplinary Environmental Studies;* for teachers of biology and social science. Dr. Robert E. Yager, Science Education Center, The University of Iowa, Iowa City, IA 52240.
(Un; 32; JH, SH; 3, 4)

THE OHIO STATE UNIVERSITY, 8 weeks, June 26—August 18: *Environmental Sciences;* for teachers of science. Dr. Victor J. Mayer, Faculty of Science Education, The Ohio State University, 1945 North High Street, Columbus, OH 43210. (Un; 30; JH, SH; 1, 2)

SAINT JOSEPH COLLEGE, 6 weeks, June 26—August 4: *Environmental Studies; Research;* for local teachers of physical science. Sr. M. Clare Markham, Department of Chemistry, Saint Joseph College, West Hartford, CT 06117.
(Seq*; 0/5; JH, SH; 4, 5)

UNIVERSITY OF WISCONSIN—RIVER FALLS, 4 weeks, June 12—July 8: *Organic Chemistry; Pesticide Use and Residue Control;* for teachers of agriculture who are also teaching high school courses in science or mathematics. Dr. James C. Dollahon, Dean, College of Agriculture, University of Wisconsin—River Falls, River Falls, WI 54022. (Seq; 0/20; SH; 2)

UNIVERSITY OF WISCONSIN—RIVER FALLS, 4 weeks, July 10—August 5: *Environmental Science; Environmental Management;* for teachers of agriculture who are also teaching high school courses in science or mathematics. Dr. James C. Dollahon, Dean, College of Agriculture, University of Wisconsin—River Falls, River Falls, WI 54022. (Seq; 0/20; SH; 2)

UNIVERSITY OF WISCONSIN—WHITEWATER, 8 weeks, June 12—August 4: *Interdisciplinary Approach to Community Environmental Quality Improvement;* for teachers of the physical and social sciences from Wisconsin and neighboring states. Dr. Charles B. Varney, Department of Geography-Geology, University of Wisconsin—Whitewater, Whitewater, WI 53190.
(Un; 35; JH, SH; 0, 1, 2, 3, 4)

UNIVERSITY OF WISCONSIN SYSTEM, at Clam Lake Field Station, Clam Lake, Wisconsin: 6 weeks, June 18—July 28: *Environmental Assessment;* for teachers of science. 1 week, July 26—August 2: *Program Evaluation and Implementation;* for administrators from schools of participants. Dr. Roy E. Heath, Board of Regents of University of Wisconsin System, Box 912, Madison, WI 53701.
(Un; 40; JH, SH; 1, 2; and 20 Administrators)

Multiple Fields

THE AMERICAN UNIVERSITY, 7 weeks, June 19—August 4: *Special Topics in Chemistry and Physics; Laboratory Experience under Research Scientists;* for teachers of chemistry and physics. Dr. Leo Schubert, Department of Chemistry, The American University, Washington, DC 20016. (Un; 40; SH; 4)

UNIVERSITY OF ARIZONA, 8 weeks, June 12—August 5: *Genetics and Evolution; Organic Chemistry; Quantitative Chemistry; Problems in Earth Science;* for teachers of science. Dr. M. G. Seeley, Department of Chemistry, University of Arizona, Tucson, AZ 85721.
(Seq; 0/55; JH, SH; 1, 2)

CLARKSON COLLEGE OF TECHNOLOGY, 8 weeks, June 26—August 19: *Chemistry; Mathematics; Physics;* for teachers of science and mathematics. Dr. George L. Jones, Jr., Department of Chemistry, Clarkson College, Potsdam, NY 13676. (Seq; 0/49; JH, SH; 3)

COLBY COLLEGE, 6 weeks, June 26—August 5: *Biology; Chemistry; Geology; Mathematics; Physics;* for teachers of science and mathematics. Dr. Evans B. Reid, Department of Chemistry, Colby College, Waterville, ME 04901.
(Seq; 0/70; JH, SH; 2, 3, 4)

DUKE UNIVERSITY, 9 weeks, June 19—August 18: *Biology; Chemistry; Mathematics; Physics;* for teachers of biology, chemistry, and mathematics. Dr. Sherwood Githens, Jr., Department of Education, Duke University, Durham, NC 27708. (Seq; 0/60; JH, SH; 3, 4)

FISK UNIVERSITY, 8 weeks, June 5—July 29: *Advances in Chemistry; Basic Concepts in Physics; Basic Concepts in Biology; Advances in Biology; Applied Mathematics;* for teachers of science. Dr. George Hull, Jr., Department of Biology, Fisk University, Nashville, TN 37203. (Seq; 0/45; JH, SH; 2, 3)

FLORIDA STATE UNIVERSITY (see Institutes for Supervisors, page 52).

GEORGE PEABODY COLLEGE, 8 weeks, June 19—August 11: *Field Botany; Project Physics Course; Radiation Biology; Biochemistry; Science, Technology and Society; Field Zoology; Advanced Organic Chemistry; Audio-Visual Teaching Techniques;* for teachers of science. Dr. Gus Tomlinson, Department of Biology, Box 153, George Peabody College, Nashville, TN 37203. (Seq; 0/40; JH, SH; 3, 4, 5)

UNIVERSITY OF GEORGIA, 9 weeks, June 12—August 12: *Botany; Entomology; Geology; Heat, Light, and Sound; Organic Chemistry;* for teachers of science. Dr. W. H. Waggoner, Department of Chemistry, University of Georgia, Athens, GA 30601. (Seq; 0/18; SH; 1, 2)

HAMPTON INSTITUTE, 8 weeks, June 12—August 4: *Chemistry; Mathematics; Physics;* for teachers of science and mathematics. Dr. Victor H. Fields, Department of Chemistry, Hampton Institute, Hampton, VA 23368. (Un; 40; JH, SH; 1, 2)

UNIVERSITY OF IDAHO, 8 weeks, June 12—August 4: *Chemistry; Physics; Mathematics; Biology;* for teachers of science and mathematics. Dr. E. E. Tylutki, Department of Biological Sciences, University of Idaho, Moscow, ID 83843. (Seq; 0/60; JH, SH; 0, 1, 2)

KANSAS STATE COLLEGE OF PITTSBURG, 8 weeks, June 5—July 28: *Biology; Chemistry; Mathematics;* for teachers of science and mathematics. Dr. Harold L. Thomas, Department of Mathematics, Kansas State College, Pittsburg, KS 66762. (Seq; 0/40; JH, SH; 2, 3)

KANSAS STATE TEACHERS COLLEGE, 10 weeks, June 5—August 11: *Chemistry; Physics;* for teachers of physical sciences. Dr. S. Winston Cram, Division of Physical Science, Kansas State Teachers College, Emporia, KS 66801.
(Seq; 0/20; SH; 1, 2, 3)

MIAMI UNIVERSITY, 8 weeks, June 19—August 11: *Structural and Experimental Botany; Modern Chemistry; Inorganic Synthesis; Research in Chemistry; Biochemical Genetics; Experimental Embryology;* for teachers of science. Dr. Bruce V. Weidner, Department of Chemistry, Miami University, Oxford, OH 45056.
(Seq; 0/35; JH, SH; 0, 1, 2)

MIDDLE TENNESSEE STATE UNIVERSITY, 10 weeks, June 5—August 12: *Modern Biology; Fundamentals of Physics; Terrestrial Ecology; Analytical Chemistry; Abstract Algebra; Modern Physics; Science and Mathematics Curricula; Implementation of Curricula in School Programs;* for teachers with assignments in two or more areas of science and mathematics. Dr. J. Eldred Wiser, Department of Chemistry and Physics, Middle Tennessee State University, Murfreesboro, TN 37130. (Seq; 0/54; SH; 0, 3)

UNIVERSITY OF MISSISSIPPI (see Comprehensive Projects, page 56).

MISSISSIPPI STATE UNIVERSITY, 10 weeks, June 12—August 19: *Zoology; Chemistry; Physics; Mathematics;* for teachers of science and mathematics. Prof. John L. Tilley, Department of Mathematics, Mississippi State University, P.O. Drawer MA, State College, MS 39762.
(Seq; 0/19; JH, SH; 2)

UNIVERSITY OF MISSOURI—ROLLA, 8 weeks, June 5—July 28: *Physical Chemistry; Mathematical Analysis; Finite Mathematics; Studies in Geometry; Physical Mechanics;* for teachers of chemistry, physics, and mathematics. Dr. Harold Q. Fuller, College of Arts and Sciences, University of Missouri—Rolla, Rolla, MO 65401. (Seq; 0/50; SH; 3, 4)

MORGAN STATE COLLEGE, 6 weeks, June 19—July 28: *Bioecology (BSCS); Chemistry (CHEM Study); Earth Science (ESCP); Mathematical Methods of Analysis in Science; Physics (PSSC); Seminar;* for teachers of science. Dr. Thomas P. Fraser, Department of Science Education, Morgan State College, Baltimore, MD 21212. (Seq*; 0/52; JH, SH; 4, 5)

NEW MEXICO HIGHLANDS UNIVERSITY, 10 weeks, June 12—August 18: *Biology; Chemistry; Mathematics; Physics;* for teachers of science and mathematics. Dr. Robert L. S. Amai, Department of Chemistry, New Mexico Highlands University, Las Vegas, NM 87701. (Seq; 0/32; JH, SH; 1)

UNIVERSITY OF NORTH DAKOTA, 8 weeks, June 19—August 12: *Biology; Chemistry; Astronomy; Meteorology; Geology; Physics; Seminar in Science and Society;* for teachers of science. Dr. M. P. Behringer, Department of Biology, University of North Dakota, Grand Forks, ND 58201. (Seq; 0/40; JH, SH; 1, 2, 3, 4)

NORTH DAKOTA STATE UNIVERSITY, 8 weeks, June 14—August 9: *Chemistry; Physics; Zoology;* for teachers of science. Dr. Joel W. Broberg, College of Chemistry and Physics, North Dakota State University, Fargo, ND 58102. (Seq; 0/23; JH, SH; 2, 3)

OREGON STATE UNIVERSITY, 8 weeks, June 19—August 10: *Biology; Chemistry; Earth Sciences; Mathematics; Physical Science; Physics; Oceanography;* for teachers of science. Dr. Fred W. Fox, Department of Science Education, Oregon State University, Corvallis, OR 97331. (Seq; 0/36; JH, SH; 2, 3)

POLYTECHNIC INSTITUTE OF BROOKLYN, 7 weeks, July 3—August 18: *Chemistry and Physics of the Solid State (Materials Science);* for teachers of science. Prof. George J. Fischer, Department of Physical and Engineering Metallurgy, Polytechnic Institute of Brooklyn, Brooklyn, NY 11201. (Un; 25; JH, SH; 1)

UNIVERSITY OF PORTLAND, 8 weeks, June 26—August 18: *Integrated Physics-Chemistry;* for teachers of physics, chemistry, and general science. Dr. Paul E. Wack, Department of Physics, University of Portland, 5000 N. Willamette Boulevard, Portland, OR 97203.
(Seq; 0/32; SH; 2, 3)

RANDOLPH-MACON WOMAN'S COLLEGE, 8 weeks, June 26—August 18: *Genetics and Animal Behavior; Equilibria and Energy Changes; Finite Mathematics and Computer Science; Electricity, Magnetism, and Modern Physics; Seminar;* for teachers (men and women) of science and mathematics. Dr. Helen L. Whidden, Department of Chemistry, Randolph-Macon Woman's College, Lynchburg, VA 24504.
(Seq; 0/44; JH, SH; 2, 3)

RENSSELAER POLYTECHNIC INSTITUTE, 8 weeks, June 26—August 18: *Physical Chemistry; Differential Equations; Foundations of Classical and Modern Physics; Astronomy; Nucleonics and Instrumental Methods; Quantum Mechanics; Biochemistry; Vector Algebra;* for teachers of science. (Director: Dr. S. C. Bunce, Rensselaer Polytechnic Institute.) Write: Dean Mark Jordan, Office of Continuing Studies, Rensselaer Polytechnic Institute, Troy, NY 12181.
(Seq; 0/63; JH, SH; 3, 4, 5)

ROOSEVELT UNIVERSITY, 6 weeks, June 26—August 4: *Mathematical and Numerical Methods in Science; Waves and Oscillations; Quantum Physics; Stoichiometry; Chemical Dynamics;* primarily for teachers of chemistry and physics in the Greater Chicago area. Dr. Arthur Harris, Department of Physics, Roosevelt University, Chicago, IL 60605. (Seq; 0/39; SH; 2, 3, 4)

SEATTLE UNIVERSITY, 8 weeks, June 19—August 11: *Chemistry; Physics; Mathematics;* for teachers of science and mathematics. Rev. James J. Cowgill, S.J., Department of Physics, Seattle University, Seattle, WA 98122.
(Seq; 0/55; SH; 3, 4)

THE UNIVERSITY OF THE SOUTH, 8 weeks, June 19—August 12: *Biology; Chemistry; Mathematics; Physics; Radioisotopes;* for teachers of science and mathematics. Dr. Eric H. Ellis, Box 1004 SPO, The University of the South, Sewanee, TN 37375. (Seq; 0/42; SH; 3, 4)

SOUTH CAROLINA STATE COLLEGE, 6 weeks, June 12—July 21: *Biology; Chemistry; Mathematics;* for teachers of biology and chemistry. Dr. Lewie C. Roache, Department of Natural Sciences, South Carolina State College, Orangeburg, SC 29115. (Un; 40; JH, SH; 1, 2)

UNIVERSITY OF SOUTH DAKOTA (see Comprehensive Projects, page 57).

SYRACUSE UNIVERSITY, 6 weeks, July 3—August 11: *Organic Chemistry; Calculus with Analytic Geometry; Concepts and Theories of Physics; Topics in the Physical Sciences;* for teachers of chemistry, physics, and general science. Dr. Nathan Ginsburg, Department of Physics, Syracuse University, Syracuse, NY 13210. (Seq; 0/38; JH, SH; 2, 4)

UNION COLLEGE, 8 weeks, June 26—August 18: *Biology; Chemistry; Earth Science; Mathematics; Physics;* for teachers of science and mathematics. Dr. Edwin F. Gillette, Department of Mathematics, Union College, Schenectady, NY 12308. (Seq; 0/75; JH, SH; 1, 2)

VIRGINIA STATE COLLEGE (see Comprehensive Projects, page 57).

WASHINGTON STATE UNIVERSITY, 8 weeks, June 19—August 11: *Biology; Physics; Chemistry; Earth Science; Environmental Science;* for teachers of science. Prof. Harry H. Batey, Jr., Department of Chemistry, Washington State University, Pullman, WA 99163. (Seq; 0/50; JH, SH; 1, 2, 3, 4)

WESLEYAN UNIVERSITY, 6 weeks, July 6—August 18: *Astronomy; Biology; Chemistry; Earth Sciences; Mathematics; Philosophy of Science; Physics;* for teachers of science and mathematics. Dr. James E. Cronin, Wesleyan Station, Middletown, CT 06457. (Seq; 0/36; JH, SH; 0, 1, 2, 3, 4)

WORCESTER POLYTECHNIC INSTITUTE, 8 weeks, June 26—August 18: *Biology; Physics;* for teachers of science. Prof. Richard F. Morton, Department of Physics, Worcester Polytechnic Institute, Worcester, MA 01609. (Seq*; 10/40; SH; 1, 2)

UNIVERSITY OF WYOMING (see Comprehensive Projects, page 57).

Course and Curriculum Development

UNIVERSITY OF CALIFORNIA, BERKELEY, 8 weeks, June 19—August 11: *Teacher-Initiated Curriculum Projects;* primarily for teams of science teachers from the western states. Dr. Frank Crawford, Lawrence Hall of Science, University of California, Berkeley, CA 94720.
(Un; 35; JH; 1)

FLORIDA STATE UNIVERSITY, 8 weeks, June 19—August 11: *Teacher-Proposed Projects for Individualizing Science Instruction;* for teachers of science. Dr. Paul Westmeyer, Department of Science Education, Florida State University, Tallahassee, FL 32306. (Un; 30; SH; 2, 3)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 5 to 8 weeks, June 26—August 25: *Course and Curriculum Development (in Biology, Chemistry, Mathematics, Physics, Environmental Science, and Interdisciplinary Topics);* for teams of two to five teachers from single schools. (Director: Prof. Jerrold R. Zacharias, Massachusetts Institute of Technology.) Write: Dr. James S. Strickland, Education Research Center, M.I.T., Room 20C-228, Cambridge, MA 02139.
(Un; 25; JH, SH; 3, 4)

UNIVERSITY OF NEW HAMPSHIRE, 6 weeks, June 26—August 4: *Mathematics Curriculum Adaptation for Use by Local School Districts;* for teams of teachers of mathematics. Dr. Richard H. Balomenos, Department of Mathematics, Kingsbury Hall, University of New Hampshire, Durham, NH 03824.
(Un; 30; JH, SH; 3, 4, 5)

STATE UNIVERSITY COLLEGE AT OSWEGO, 6 weeks, July 10—August 18: *Laboratory Innovations in Biology;* for teachers of the New York State biology syllabus. Dr. Leland C. Marsh, Department of Botany and Physiology, State University College, Oswego, NY 13126.
(Seq; 0/35; SH; 4)

Institutes for Supervisors

(Supervisors may also submit applications to the various other institutes listed in this booklet.)

FLORIDA STATE UNIVERSITY, 7 weeks, June 16—August 3: *New Curriculum Developments;* for science supervisors. Dr. Paul Westmeyer, Department of Science Education, Florida State University, Tallahassee, FL 32306.
(Un; 30; JH, SH; 3, 4, 5)

THE PENNSYLVANIA STATE UNIVERSITY, 6 weeks, June 26—August 4: *Computers and Computing;* for key teachers and supervisors of mathematics. (Director: Dr. Ralph T. Heimer, The Pennsylvania State University.) Write: Dr. Lars C. Jansson, 302 Rackley Bldg., The Pennsylvania State University, University Park, PA 16802. (Un; 35; JH, SH; 4, 5)

SHORT COURSES FOR SECONDARY SCHOOL TEACHERS AND SUPERVISORS

A small program of Short Courses for Secondary School Teachers and Supervisors is being supported by the National Science Foundation in 1972. These instructional conferences, listed below, are shorter and usually more specialized than Summer Institutes. They provide free registration and tuition plus allowances toward the costs of board and room and travel, but no stipends or dependency allowances. Allowances from Short Courses will not affect institute stipend eligibility, and teachers may receive allowances from Short Courses even though their eligibility for institute stipends is presently exhausted (see pp. 3-5).

AMERICAN MUSEUM—HAYDEN PLANETARIUM, 2 weeks, August 14—August 25: *Astronomy;* for teachers of astronomy, earth science, and related subjects. Dr. Mark R. Chartrand III, American Museum—Hayden Planetarium, 81 Street and Central Park West, New York, NY 10024. (Un; 40; JH, SH; 0, 1)

BALDWIN-WALLACE COLLEGE, 3 weeks, June 18—July 7: *Laboratory Culture and Use of Marine Organisms;* for teachers of biology. Dr. John W. Miller, Department of Biology, Baldwin-Wallace College, Berea, OH 44017.
(Un; 24; JH, SH; 4)

UNIVERSITY OF CALIFORNIA, BERKELEY, two 3-week programs, July 17—August 4 or August 7—August 25: *Environmental Studies;* for teachers and supervisors of science in the Berkeley area. Prof. Donald L. Dahlsten, Lawrence Hall of Science, University of California, Berkeley, CA 94720. (Un; 32; SH; 2, 3)

UNIVERSITY OF COLORADO, 3 weeks, July 17—August 4: *National Curricular Studies;* for science supervisors and college science education personnel. Dr. James R. Wailes, Hellems Annex 311, University of Colorado, Boulder, CO 80302.
(Un; 30 JH, SH; 10 Col; 3, 4)

THE UNIVERSITY OF IOWA, 4 weeks, June 19—July 14: *Computer Programming and Numerical Methods; Seminar in Computer-Assisted Mathematics;* primarily for Iowa teachers of mathematics. Dr. Henry S. Kepner, Jr., University Schools, The University of Iowa, Iowa City, IA 52240. (Un; 25; JH, SH; 4)

KNOX COLLEGE, 2 weeks, June 19—June 30: *Curriculum Development in Science—Technology and Society;* for teachers of science. Dr. Herbert Priestley, Department of Physics, Knox College, Galesburg, IL 61401. (Seq; 0/30; SH; 2, 3, 4, 5)

MARS HILL COLLEGE, 3 weeks, June 5—June 23: *Biology (BSCS Green Version);* for teachers of biology in Appalachia. Dr. L. M. Outten, Department of Biology, Box 722-C, Mars Hill College, Mars Hill, NC 28754. (Un; 30; SH; 2, 3)

MICHIGAN STATE UNIVERSITY, 3 weeks, July 31—August 18: *Foundations of Mathematics;* for secondary school teachers and supervisors who will conduct in-service training for elementary school teachers. Dr. John Wagner, Science and Mathematics Teaching Center, Michigan State University, East Lansing, MI 48823.
(Un; 30; SH; 3, 4)

UNIVERSITY OF NEBRASKA, 3 weeks, July 17—August 4: *Teaching Mathematics to the Reluctant Learner;* for teachers and supervisors of mathematics. Dr. Milton W. Beckmann, Department of Secondary Education, University of Nebraska, Lincoln, NB 68508.
(Un; 25; JH, SH; 2, 3)

NORTHWESTERN UNIVERSITY, 4 weeks, July 10—August 4: *Economic Problems of Illinois and Their Relationship to the National Economy;* for Illinois teachers and supervisors of economics and other social sciences. Dr. Theral T. Herrick, Illinois Council on Economic Education, 1740 Orrington Avenue, Evanston, IL 60201.
(Un; 32; JH, SH; 1)

THE OHIO STATE UNIVERSITY, 2 weeks, July 5—July 15: *Junior High School Science Programs;* for principals and science curriculum supervisors. Dr. Victor J. Mayer, Faculty of Science and Mathematics Education, The Ohio State University, 1945 North High Street, Columbus, OH 43210. (Un; 30; JH; 0)

POLYTECHNIC INSTITUTE OF BROOKLYN, 2 weeks, July 17—July 28: *Recycling of Municipal Wastes;* for teachers of science in the New York area. Prof. Henry F. Soehngen, Department of Civil Engineering, Polytechnic Institute of Brooklyn, 333 Jay Street, Brooklyn, NY 11201.
(Un; 40; SH; 0)

PRINCETON UNIVERSITY, 4 weeks, July 24—August 19, at Yellowstone-Bighorn Research Association Geology Field Camp, Red Lodge, Montana: *Field Studies in Physical and Historical Geology (Rocky Mountains);* for teachers of earth science. Dr. Erling Dorf, Department of Geological and Geophysical Sciences, Princeton University, Princeton, NJ 08540.
(Un; 30; JH, SH; 1, 2)

UNIVERSITY OF SANTA CLARA, 2 weeks, July 17—July 28: *Simulation Techniques in Teaching the Social Sciences;* for teachers of the social sciences from the Los Angeles, San Francisco, and Seattle metropolitan areas. Dr. Bruce D. Hamlett, Department of Political Science, University of Santa Clara, Santa Clara, CA 95053.
(Un; 30; SH; 3, 4)

SHORTER COLLEGE, 3 weeks, June 12—June 30: *Natural Resource Use;* for teachers and supervisors of science. Dr. Philip Greear, Box 2, Shorter College, Rome, GA 30161.
(Un; 25; JH, SH; 0)

TENNESSEE STATE UNIVERSITY, 4 weeks, June 19—July 14: *Mathematics for Junior High School;* for teachers of mathematics. Dr. Sadie C. Gasaway, Department of Physics and Mathematics, Tennessee State University, Nashville, TN 37203. (Un; 30; JH; 0, 1)

THE UNIVERSITY OF TEXAS AT EL PASO, 3 weeks, July 17—August 4: *Environmental Quality;* primarily for El Paso teachers of science and social science. Dr. James L. Milson, Department of Curriculum and Instruction, The University of Texas at El Paso, El Paso, TX 79968. (Un; 30; JH, SH; 2)

VALDOSTA STATE COLLEGE, 3 weeks, June 19—July 8: *Natural Resource Education;* for teachers of science and mathematics. Dr. Clyde E. Connell, Department of Biology, Valdosta State College, Valdosta, GA 31601.
(Un; 20; JH, SH; 0)

VANDERBILT UNIVERSITY, 4 weeks, June 19—July 14: *Drug Use and Abuse;* for teachers and supervisors of biological sciences. Dr. Oakley S. Ray, Department of Psychology, Wesley Hall, Vanderbilt University, Nashville, TN 37203.
(Un; 50; JH, SH; 1)

COMPREHENSIVE PROJECTS

NSF-supported Comprehensive Projects represent integrated approaches to teacher education with both pre-service and in-service components that offer opportunities for full- and part-time study during the academic year and summer. The following brief description of each project indicates the general nature of the academic offerings. Each project gives priority to applicants from the particular geographic area indicated in the project description. Interested teachers should contact individual project directors at the indicated addresses for details.

UNIVERSITY OF ARKANSAS: *Mathematics;* for teachers of mathematics in Arkansas. Program includes consideration of curriculum development, conduct of in-service projects, supervision of mathematics instruction, and teaching strategies, as well as subject matter. Provision is made for statewide coordination of the pre-service education of secondary mathematics teachers and for consultive services to teachers and administrators in Arkansas. Dr. William R. Orton, Department of Mathematics, University of Arkansas, Fayetteville, AR 72701.

UNIVERSITY OF MISSISSIPPI: *Biology, Chemistry* and related *Physics;* for teachers of science, primarily in Mississippi. Includes special programs for key teachers, supervisors, supervisor-trainees and teacher-interns. Consultation and resources available to teachers and administrators in Mississippi. Dr. William H. Norman, Science Education Center, University of Mississippi, University, MS 38677.

UNIVERSITY OF NOTRE DAME: *Mathematics;* for teachers of mathematics, primarily in Illinois, Indiana, Michigan and Ohio. Opportunities available for training in the conduct of in-service programs. Special programs for intern-teachers and for supervisor-trainees. Consultation available to teachers and administrators in northern Indiana and southern Michigan. Dr. Abraham Goetz, Department of Mathematics, University of Notre Dame, Notre Dame, IN 46556.

SAN JOSE STATE COLLEGE: *Mathematics;* for teachers of mathematics in California counties north of Santa Barbara County and in western Nevada. Opportunities include programs in computer science, curriculum materials, research participation, and the conduct of in-service programs. Special program for intern-teachers and for supervisor-trainees. Consultation available to teachers and administrators in service-area indicated above. Dr. Robert Pruitt, Department of Mathematics, San Jose State College, San Jose, CA 95114.

UNIVERSITY OF SOUTH DAKOTA: *Chemistry* and *Biology;* for teachers of these subjects, primarily in Iowa, Minnesota, Nebraska, North Dakota and South Dakota. Opportunities available for training in the conduct of in-service programs which emphasize new curriculum materials. Special program for intern-teachers. Consultation available to teachers and administrators in service-area indicated above. Dr. Charles R. Estee, Department of Chemistry, University of South Dakota, Vermillion, SD 57069.

VIRGINIA STATE COLLEGE: *Life (Biological)* and *Earth Sciences;* for teachers of these subjects, primarily in Virginia. Opportunities include in-service and special pre-service programs at the pre- and post-baccalaureate levels. Consultation and resources available to teachers and administrators in indicated service-area interested in implementation of new curricular materials. Dr. Richard H. Dunn, Department of Biology, Virginia State College, Petersburg, VA 23803.

UNIVERSITY OF WYOMING: *Biological* and *Physical Sciences;* for teachers of these subjects, primarily in the Rocky Mountain and Plains states. Opportunities available for training in the conduct of in-service programs at "portal schools" dealing with new curriculum materials, research participation together with students from the teachers' home school, and the development of classroom and laboratory materials. Special program for intern-teachers. Consultation available to teachers and administrators in service-area indicated above. Dr. Samuel W. Harding, Department of Physics, University of Wyoming, Laramie, WY 82070.

SUMMER PROJECTS FOR STUDENTS

Science teachers are reminded that opportunities for summer training in science and mathematics for outstanding students are provided through NSF-supported *science training projects for high ability secondary school students.* A directory listing these projects will be issued in February this year. (See page 62 on how to obtain a copy.) Student applications for summer projects must be received by the participating colleges and universities before April 1. Also, a few projects are supported for academic year activities; they are listed in the same booklet.

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OTHER NATIONAL SCIENCE FOUNDATION PROGRAMS IN SCIENCE AND MATHEMATICS FOR TEACHERS, SUPERVISORS, AND SECONDARY SCHOOL STUDENTS

The following catalogs or directories may be requested from: NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC 20550. Requests for directories *by specific titles* may be submitted at any time; directories will be mailed as soon as they become available. *Please use a separate postal card for each kind of directory requested.*

"Academic Year Study for Secondary School Teachers and Supervisors, Directory for 1972-73" (E 71-P-9)

"In-Service Institutes for Secondary School Teachers, Directory for 1972-73" (E 72-P-1)

"Cooperative College-School Science Program, Directory for 1972-73" (E 72-P-23)

"Science Training Programs for High Ability Secondary School Students, Directory for 1972" (E 72-P-29)

"College Teacher Programs, Directory for 1972" (E 71-U-9)

STANDARD POSTAL ABBREVIATIONS

Alabama	AL
Alaska	AK
Arizona	AZ
Arkansas	AR
California	CA
Colorado	CO
Connecticut	CT
Delaware	DE
District of Columbia	DC
Florida	FL
Georgia	GA
Hawaii	HI
Idaho	ID
Illinois	IL
Indiana	IN
Iowa	IA
Kansas	KS
Kentucky	KY
Louisiana	LA
Maine	ME
Maryland	MD
Massachusetts	MA
Michigan	MI
Minnesota	MN
Mississippi	MS
Missouri	MO
Montana	MT
Nebraska	NB
Nevada	NV
New Hampshire	NH
New Jersey	NJ
New Mexico	NM
New York	NY
North Carolina	NC
North Dakota	ND
Ohio	OH
Oklahoma	OK
Oregon	OR
Pennsylvania	PA
Puerto Rico	PR
Rhode Island	RI
South Carolina	SC
South Dakota	SD
Tennessee	TN
Texas	TX
Utah	UT
Vermont	VT
Virginia	VA
Washington	WA
West Virginia	WV
Wisconsin	WI
Wyoming	WY